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VOLUME THREE

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NOTICE

The present volume of the TRANSACTIONS has been issued in two numbers representing the papers read from January to December, 1935, before the College and its Sections. While a few of the papers have been presented in full, most of the Proceedings are in abstract or by title only, giving when possible the reference to place of complete publication.

The College holds itself in no way responsible for the statements or opinions set forth in the various papers or abstracts in its TRANSACTIONS.

Edited by

J. HAROLD AUSTIN, M.D.

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CONTENTS

VOLUME III

(Number in italics indicates Part of Volume III in which item appeared)

Memoir of Dr. James C. Wilson ..... *1* i
Memoir of Dr. Howard F. Hansell ..... *1* viii
Memoir of Dr. Edmund B. Piper ..... *1* xi
Memoir of Dr. Thomas McCrae ..... *2* xv
Memoir of Dr. Charles A. Fife ..... *2* xix
Memoir of Dr. Barton Cooke Hirst ..... *2* xxv
Memoir of Dr. Alexander Crever Abbott ..... *2* xxx
Annual Address of the President. By Alfred Stengel, M.D. ..... *2* xxxv
Annual Report of the Library Committee ..... *2* xxxviii
List of Officers and Standing Committees, 1935 ..... *2* lii
List of Presidents, Lectures and Prizes ..... *2* lv
List of Fellows, Non-Resident Fellows and Honorary Fellows ..... *2* lvi
Necrological List ..... *2* lxxxii

Surgery of the Sympathetic Nervous System. By Francis C. Grant, M.D. *1* 1
The Nathan Lewis Hatfield Lecture, XIII:
(*a*) Chemical Aspects of Antigens, Antibodies and their Interaction. By Michael Heidelberger, Ph.D. *1* 2
(*b*) Certain Clinical Aspects of Immunology. By William H. Park, M.D. *1* 2
The Specific Treatment and Prevention of Pneumonia. The James M. Anders Fund Lecture. By Milton J. Rosenau, M.D. *1* 6
Notes on Some Medals and Plaquettes Relating to Medical Men and Events. By R. Tait McKenzie, M.D., LL.D., R.C.A. *1* 8
The Nervous Control of the Heart and Blood Vessels. By D. W. Bronk, Ph.D. *1* 14
Certain Observations Concerning Hypertension and Its Treatment. By E. J. G. Beardsley, M.D. *1* 16
Development of the Different Layers of the Cerebral Cortex with Reference to Some Pathological Cases. The Forebrain of Prehistoric Races. The Mary Scott Newbold Lecture. XXXIV. By C. U. Ariens Kappers, M.D., Sc.D. *1* 20
The Inter-relationships of the Various Glands of Internal Secretion Concerned with Metabolism. The Mary Scott Newbold Lecture. XXXV. By C. N. H. Long, M.D., D.Sc. *2* 75
Looking at Tuberculosis, Cancer, Diabetes, Heart Disease and Syphilis from the Public Health Point of View. The James M. Anders Fund Lecture. By John L. Rice, M.D. *2* 77
The Histology and Pathology of the Esophagus with Clinical Applications. The Mütter Lecture. By Harris P. Mosher, M.D., Sc.D. ... *2* 80

Proceedings of the Section on Ophthalmology .. *1* 33, *2* 83

Proceedings of the Section on Otolaryngology

Some Phases of Blood Reactions in Acute Infections of the Ear, Nose and Throat. By Max M. Strumia *1* 35

147275

JUL 2 1937

CONTENTS

The Venous Channels of the Base of the Skull and their Relation to Otolaryngology. By Oscar V. Batson *1* 36
Defective Surgical Instruments as an Avoidable Cause of Foreign Body Accidents. By Chevalier Jackson *1* 36
Benzyl Methyl Carbinamine (Benzedrine, N.N.R.). A Study of the Rapidity and Duration of its Shrinking Action in the Nasal Turbinates. By A. A. S. Giordano *1* 37
The Use of Benzedrine in the Eustachian Tube and Middle Ear; with Apparatus for its Application. By Earl LeRoy Wood *1* 38
Review of the Clinical Picture of Suppuration of the Petrous Pyramid. By Curtis C. Eves and E. Frank Hooker *1* 38
Vestibular Tests: Their Practical Application. By Benjamin H. Shuster *1* 39
A Review of the Aural and Orbital Complications of Scarlet Fever at the Philadelphia Hospital for Contagious Diseases from 1922 to 1934. By Horace J. Williams *1* 41
Chronic Inflammatory Lesions of the True Vocal Cords; Observations on Diagnosis and Treatment. By Gabriel Tucker *1* 43
Streptococcic Meningitis of Otitic Origin, with Recovery. By Karl M. Houser *1* 43
Memoir of Dr. Edward Gleason. By Philip Stout *1* 45
Radical External Operation in a Case of Suppurative Sinusitis. By Oram R. Kline *1* 45
Rhinoscleroma: A Case of Scleroma of the Larynx and Trachea Associated with Atrophic Rhinitis. By Chevalier L. Jackson *1* 46
Lateral Sinus Thrombophlebitis. By Edward H. Campbell *1* 46
Sympathetic Ganglion Neurosis Following Sinusitis and Relieved by Acetyl-beta-methylcholine chloride. By Wm. Hewson *2* 85
Case Report on Nasal Ionization. By Philip S. Stout *2* 87
An Unusual Case of Carcinoma of the Tonsil. By George B. Wood.... *2* 87
Extensive Osteomyelitis with Brain Abscess Complicating Frontal Sinusitis. By Samuel R. Skillern, Jr. *2* 88
The Surgical Treatment of Ménière's Disease. By Walter E. Dandy. *2* 89
Memoir of Dr. J. Clarence Keeler. By Warren B. Davis *2* 92
Case Report: Osteomyelitis of the Skull; Wide Surgical Resection with Rapid Regeneration. By M. Valentine Miller *2* 92
Motion Picture Demonstration of the Movements of the Larynx. By George M. Coates *2* 94
The Importance of the Blood Count in Acute Mastoid Infections. By Frederick Boerner *2* 94

Proceedings of the Section on General Medicine

A Comparative Study of the Actions of Morphine and Dilaudid (Dihydromorphinone Hydrochloride) on the Intact Small Intestine of the Dog. By Charles M. Gruber and John T. Brundage *1* 50
Some Observations on the Origin and Effects of Arterial Embolism. By J. C. Doane and Nathan Blumberg *1* 51
Idiopathic Myocardial Regeneration of Pregnancy and the Puerperium. By Benjamin A. Gouley, Samuel Bellet and Thomas McMillan *1* 52
Blood Sedimentation Rate in Diabetes Mellitus. By David W. Kramer. *1* 53
Tonsillitis with Meningeal Symptoms. By David Riesman *1* 54
The Minor Blood Agglutinins and their Possible Relation to Post-transfusion Reactions. By Wm. P. Belk *1* 54
Changes in Pulmonary Tuberculosis following Abdominal Compression. By Burgess Gordon *1* 55
The Clinical and Roentgenologic Features of Pulmonary Metastasis. By John T. Farrell, Jr. *1* 56
Estimation of Basal Metabolic Rate from Pulse Rate and Pulse Pressure. By Bernard I. Comroe *1* 57

CONTENTS

Certain Effects of Decholin-Sodium upon the Kidney and Liver in Cats with Total Biliary Stasis. By A. Cantarow and H. L. Stewart..*1* 58
The One-hour Two-dose Dextrose Tolerance Test. By Herbert T. Kelly ..*1* 59
Diabetic Acidosis Preceded and Followed by Spontaneous Hypoglycemia. By W. Wallace Dyer and Edward S. Dillon ..*1* 60
Report of a Case of Aplastic Acute Anemia. By William E. Parke..*1* 60
Medullary Tumor of the Suprarenals, Associated with Hypertension and Juvenile Arteriosclerosis. By D. N. Kremer and Robert W. Mathews ..*1* 61
Aneurysm of the Thoracic Aorta: Report of a Case with Surgical Intervention. By Russell S. Boles and Moses Behrend ..*1* 62
Bleeding Peptic Ulcer: An Analysis of 100 Cases. By James H. Sterner and Edward L. Bortz ..*1* 63
The Prognostic and Pathogenetic Significance of the Distribution of Pulmonary Tuberculous Lesions. By F. Maurice McPhedran ..*1* 64
Recovery from Subacute Bacterial Endocarditis: Presentation of a Case. By Anna P. Klemmer and Roland N. Klemmer ..*1* 65
Coarctation of the Aorta. By Reynold S. Griffith and R. Manges Smith ..*1* 66
Serial Vital Capacity Determinations: A Method of Increasing the Diagnostic Value of this Test. By John H. Arnett ..*1* 67
Intermittent Claudication Studied by a Graphic Method. By Lewis H. Hitzrot, Meyer Naide and Eugene M. Landis ..*2* 95
Excretion of Prolan in Essential Hypertension. By Maxwell Scarf and S. Leon Israel ..*2* 96
Low Blood Urea. By Frank E. Leivy, Wm. G. Bernhard and Truman G. Schnabel ..*2* 96
Persistent Pain in the Shoulder Region Following Myocardial Infarction. By Joseph Edeiken and Charles C. Wolferth ..*2* 97
Pentosuria. By F. Wm. Sunderman ..*2* 98
Experimental Studies on Cystinuria. By James C. Andrews and Alexander Randall ..*2* 98
Hereditary Occurrence of Enlarged Parietal Foramina. By O. H. Perry Pepper and Eugene P. Pendergrass ..*2* 99
Genetic Aspects of Certain Blood System Disorders. By Thomas FitzHugh, Jr. ..*2* 100
A Comparison of the Effectiveness of Glutamic Acid and Hydrochloric Acid as Replacement Therapy in Anacidity Measured by Fractional Gastric and Hydrogen Ion Concentration Curves. By Harry Shay, J. Gershon-Cohen and Samuel S. Fels ..*2* 101
The Electrocardiogram as an Aid in the Diagnosis and Prognosis of Coronary Occlusion. By Joseph B. VanderVeer and L. Emmitt Brown, Jr. ..*2* 101
Studies of Sulphur Metabolism of the Skin. By Joseph V. Klauder and Herman Brown ..*2* 102

Proceedings of the Section on Medical History..*1* 68, *2* 104

Proceedings of the Section on Public Health and Industrial Hygiene

Volatile Solvent Hazards and How they may be Minimized. By Henry Field Smyth ..*1* 72
The Capacity to Work. By Henry H. Kessler ..*1* 73
The Army Medical Officer and Public Health. By Brig. Gen. M. A. DeLaney ..*2* 105
Index ..*2* lxxxiii

January 2

SURGERY OF THE SYMPATHETIC NERVOUS SYSTEM

By FRANCIS C. GRANT, M.D.

Much of the present surgery of the sympathetic nerves stems from the clinical research of Dr. S. Weir Mitchell, so that it is quite appropriate that we should review this subject in Mitchell Hall.

As a result of the anatomical studies and clinical experiences sympathetic surgery at the present time is directed against the main trunks of the sympathetic nerves. Peri-arterial sympathectomy has been ineffective and has, therefore, been abandoned.

Sympathectomy surgery is employed for relief in three main groups of conditions:

1. To relieve peripheral vascular spasm, as in Raynaud's disease.

2. To relieve pain, as in dysmenorrhea, pelvic cancer, Buerger's disease and causalgia.

3. To relieve the spasm of various smooth muscle groups, as in the operation for relief of Hirschsprung's disease, and urinary retention accompanying cord bladder.

There is the possibility that further experimental research may show that certain cases of vascular hypertension can be relieved by sectioning the proper sympathetic connections.

Surgical results in all these groups of cases were shown and the indications for surgical technique briefly outlined.

February 6

THE NATHAN LEWIS HATFIELD LECTURE, XIII

(*a*) Chemical Aspects of Antigens, Antibodies, and their Interaction

By MICHAEL HEIDELBERGER, Ph.D.

The chemistry of antigens was first discussed, with special reference to "haptens," or the determinant groupings of antigenic specificity. Examples given were the aromatic azo compounds introduced mainly into the tyrosine and histidine groupings of proteins, with consequent modification of their specificity, and the bacterial specific polysaccharides, of importance in bacterial specificity. Antibodies were next taken up and the conclusion was drawn that these were modified serum globulins which derived their special character from the presence of antigen or its fragments at the place of globulin synthesis, rather than from the actual incorporation of antigen fragments into the antibody molecule. The mechanism of antigen-antibody interaction was next discussed and illustrated with experiments showing the close analogy of the precipitin reaction with inorganic chemical precipitation. In conclusion, a quantitative theory of the precipitin reaction was presented, based on the laws of classical chemistry.

(*b*) Certain Clinical Aspects of Immunology

By WILLIAM H. PARK, M.D.

As my part of the evening session, I have been asked to take up the subject of immunity from the more popular standpoint. The three topics which I have chosen are first, diphtheria toxoid, a chemical agent producing immunity; second, the killed poliomyelitis virus; and last, BCG, an attenuated tubercle bacillus.

As you may know, the first immunization against diphtheria in human beings was begun in an experimental way by Behring

in 1914. His work was hardly started when it was interrupted and left incomplete by the breaking out of the war. At this time we were using a preparation of toxin-antitoxin in the New York City Health Department for the immunization of horses. At that time, however, there was much difficulty in testing out the value of the vaccine in children, because the Schick test had not yet been discovered. With its discovery we were able to utilize a slightly toxic mixture for the vaccination of children. After fifteen years of the use of toxin-antitoxin we realized that a more potent immunizing substance could be made with the stronger toxin then being produced in the form of toxoid. This was done by adding one half per cent of formalin to the toxin and allowing the mixture to remain from four to six weeks in the incubator at 37½° C. This toxoid was found to be safe, and the injection of two doses gave somewhat better results than three of the diphtheria toxin-antitoxin. The only objection was that in older children and adults the local and constitutional reactions were more frequent and more severe. Shortly after this it was discovered by Glenny in England and utilized in human beings by Havens of Alabama, that the precipitate formed by adding two per cent of alum to the toxoid was several times stronger in its effect than the diphtheria toxoid in the fluid form. A dose of 1 cc. of this material suspended in normal salt solution was more potent than two doses of diphtheria fluid toxoid. This precipitate is now coming into general use. Children receiving one dose of this toxoid will change from a Schick positive condition to a Schick negative condition in something over 95 per cent. The precipitate is very slowly absorbed, leaving small lumps in the tissues for several weeks. This slow absorption is probably the reason for its effectiveness.

There is still another preparation which is of value for adults. This is the toxoid flocculi developed by our Dr. Povitzky. This forms when toxoid and antitoxin in proper amounts are mixed together. This is heated thus destroying the antitoxin. It is dissolved before use and produces in two doses the same result as the precipitate does in one dose. Its injection causes almost no annoying reaction.

With these preparations the conquest of diphtheria is certainly in our hands. The emphasis should be placed upon the immunization of children between the ages of six and twelve months. If

sixty per cent of such children are immunized, there will be very little diphtheria developing.

The Poliomyelitis Vaccine. With the knowledge obtained from a number of controlled experiments that the use of convalescent serum in cases of preparalytic poliomyelitis was useless, we turned our attention to the possibility of developing a practical vaccine against the disease. This had been attempted in 1916, but the results were not wholly satisfactory. When Dr. Brodie entered the Bacteriological Department of New York University, I asked him to undertake as his immediate problem the production of a suitable vaccine. He was already working on this matter in Montreal.

He found, by carefully testing the effect of adding various amounts of formalin to the vaccine, that by adding one-tenth of one per cent of formalin to a five per cent emulsion of the spinal cord of a monkey, dying of poliomyelitis, that such a mixture, left in the incubator for from eight to twelve hours, would become apparently dead and could be given in animals without danger. He found that monkeys receiving such a vaccine became more resistant to infection than those who recovered from an ordinary attack of poliomyelitis.

With this knowledge, after having at first tested it on ourselves to be able to state that we not only believed but that we knew it was safe, we have been attempting to immunize a number of children and some older people in infected neighborhoods. The major amount of this vaccine has been sent to California, where in Kern County they have been having a moderate epidemic. In a number of little children, in whom the blood was tested after immunization was carried out, Dr. Brodie has found that in the blood of all of them a very definite increase of antivirus substance appeared and that in eighty per cent of these an effective amount has remained for five months. The next test will be eight months after vaccination. We have at least the probability that a double injection will give immunity over the summer and that the second injection will at least double the time during which immunization remains. Of course only time can tell whether this is an effective vaccine against the virus of human beings, because there may be some differences between the virus infecting human beings and the virus of monkeys being utilized to produce vaccines. It is certainly safe.

The Calmette Vaccine. As probably all here know, the BCG vaccine was produced by Calmette from a bovine culture. This grown on special media gradually lost its virulence until, about ten years ago, he believed that it could be used safely in human beings. He had previously tested it in monkeys, rabbits and calves. Nearly a million infants have been given this vaccine in southern Europe, South America and Asia, but very little of it has been used in northern Europe or in this country.

I took up the use of this vaccine at the suggestion of Dr. McCoy, Director of the National Institute of Health. We have now used it in some 800 children and we have matched with these children more than 800 controls. As to the virulence of the organism, we are sure that the material, obtained by us eight years ago from Calmette and kept under the conditions approved of by him, has shown no virulence to the extent of producing progressive tuberculosis in animals or children.

During the past seven years, under the direction of Dr. Camille Kereszturi, this vaccine has been used in children. Only one-third as many children, who received the vaccine and were exposed to tuberculosis, have died as compared with those who did not receive it. We feel, therefore, that as the results both in animals and children vaccinated by us, as well as by others, prove that it is harmless and as animals and children who have been vaccinated have shown much less mortality to tuberculosis after exposure than those unvaccinated, it is time for us to undertake a more general vaccination of infants in tuberculous families.

Whether it is wise to use the Calmette vaccine in children as they approach maturity, the years when tuberculosis becomes most deadly, is something which must be taken up in the future. It has been done with satisfactory results in nurses who are serving in hospitals for tuberculosis.

We use at present the intradermal method only. A single dose is given. About 10 per cent develop a small glandular abscess. This heals after a few weeks, and no bad results have occurred.

March 6

THE SPECIFIC TREATMENT AND PREVENTION OF PNEUMONIA

The James M. Anders Fund Lecture

By MILTON J. ROSENAU, M.D.

The results given were the experience during the past 16 years of the Pneumonia Commission of the Metropolitan Life Insurance Company, of which I happen to be Chairman; and of the Advisory Commission of the Massachusetts Five-Year Pneumonia Program, of which I am a member. These experiences are grouped and edited with reports found in the literature. The work on the specific treatment and prevention is largely that of my colleague, Dr. Lloyd D. Felton, and some of it unpublished is given with permission.

Pneumonia is a communicable infection, but shows little tendency to focal concentration. Frank epidemics occur only in connection with measles or influenza. Epidemiological features, especially with reference to age, incidence, geographic distribution, trend, race susceptibility and accessory factors or predisposing causes, were discussed. Emphasis was placed on the need for regarding pneumonia with greater hygienic respect in order to prevent cross-infections in hospitals. The frequency of postoperative pulmonary complications, especially following operative procedures in the upper abdomen, emphasized the importance of sanitary isolation. A study of 133 cases of mixed infections showed some of them to be mixed from the beginning, others to be superinfections. It was found that in recurrent attacks the bacteriologic distribution is the same as though the patient never had a prior pneumonia. The problem of desensitization was discussed.

With the help of lantern slides, the figures giving the results of serum therapy in Type I and Type II were shown, with controls, based upon experience in Massachusetts, New York and

elsewhere. The results, beginning with the use of antipneumococcus serum, but especially since the use of Felton's highly purified and concentrated antibody solution, have been consistently encouraging.

The futility of preventing pneumonia by any of the ordinary public health measures, such as isolation, disinfection, etc., led Felton to search for a specific protective antigen. This he has been studying, and the results of a preliminary test on 3,126 volunteers were given.

In summarizing, emphasis was placed on the fact that the pathogenesis of pneumonia is complex, and the immunity mechanism probably multiple. Further experience is necessary to determine the usefulness and limitations of Felton's antibody solution. In this sense it is still in the experimental stage. The results, however, have been consistently favorable as compared with the controls available. So far as specific prevention is concerned, this phase of the subject is still in its preliminary stage and a report will be published in due course.

NOTES ON SOME MEDALS AND PLAQUETTES RELATING TO MEDICAL MEN AND EVENTS *

By R. TAIT McKENZIE

Mr. President: The commemoration of medical history and personality lends itself with peculiar appropriateness to the medal as a form of record.

It is small, easily multiplied for distribution; it may be a beautiful work of art; it is capable of carrying a descriptive inscription; and the design can include symbolism in keeping with the tradition of our ancient art.

In America there are at least two notable collections of medals, inspired by medical events or practitioners:

1. The first and perhaps the most personal is that made by Doctor Henry Barton Jacobs and now displayed in the Welch Medical Library at Johns Hopkins University. This collection was made with great care, Doctor Jacobs employing agents to be on the lookout for notable examples of the medical medallist's art in the various capitols of Europe where the field is particularly fertile. This rich storehouse of historic and artistic material has been a constant source of interest and inspiration to me as well as to the discriminating few to whom this subject appeals.

2. The other and much larger collection is the one in the Boston Medical Library, whose curator, Malcolm Storer, so recently laid down his labors. It was made and described by his father, Doctor Horatio R. Storer, perhaps the best known and certainly the most assiduous collector of medical medals in America.

His house in Newport was a Mecca for all numismatists until his death in 1922, at the advanced age of ninety-two. I first became acquainted with him in the summer of 1913 and speedily succumbed to his contagious enthusiasm. During that summer I modelled the large plaquette which you see in the case, with a

* Address before the College of Physicians of Philadelphia, April 3, 1935, on the presentation of a collection of thirteen original medals in bronze, and an illustrated catalogue of thirty-one designs made by the author.

small reduction for circulation among his friends. It bears the inscription:

> To the Master in Surgery, Medical Numismatist, Lover of Men and Nature, Horatio R. Storer, M.D., LL.D., from his friend, R. Tait McKenzie, 1913.

He was indefatigable in collecting and accurate in describing his medical spoils, and as a result of this the Boston Collection is much the most comprehensive in America. It is described, together with a voluminous catalogue of all the medical medals known to him, in a work entitled: "Medicina in Nummis," published by his children and dedicated to his memory.

There are, or were at least, two well-known Collections in England, the one of Sir Hermann Weber, dispersed at his death in 1918; and the other, of Sir Henry S. Wellcome, in the Wellcome Museum, London.

In the course of a varied artistic and medical life, involving many diverse commissions, I have been called upon to commemorate a number of medical events and to celebrate certain outstanding personalities, some of which have a special interest to the Fellows of this College.

It would far transgress the limit of time at my disposal to give even a brief description of them all, but I will endeavor to speak shortly of a few, reserving the full particulars of their origin and uses for the written catalogue that goes with the book of photographs of the thirty-one items constituting the entire series.

Thirteen of the actual medals and plaquettes, in gilded bronze for the most part, are on exhibition in the new cases recently acquired by the College, and, now that we have these at last, I trust they may give shelter to an increasing collection of these interesting records of men and events, of which perhaps these few that you now see as a first exhibit may serve as a nucleus.

It is perhaps natural that in delineating events connected with medicine, the personality of Aesculapius would first come to the mind, and his head or figure has always been a favorite subject. Twenty-seven Greek cities used his bust or figure on their coinage, sometimes with attributes such as the cupping-glass, the omphalos, the serpent, the goat, which suckled him, the sacrificial cock, the palm, the soothing poppy, and most frequently of all the serpent and staff.

Perhaps nothing has been more persistently misrepresented than this same staff and serpent. It has been confused with the winged caduceus of Mercury with its two serpents in close embrace, sometimes even using the motto: "Omnia tenet copula."

Now, Mercury was the God of Commerce, mutable and uncertain, shrinking with the cold, expanding with the heat, associated with the great luetic scourge of civilization. He was, above all, the patron of thieves and liars; so that while it might be appropriate to consider him as the inspired and especial patron of traders, brokers and bankers, he is not the God our venerable and esteemed craft should delight to honor.

The true staff of Aesculapius is a sturdy club, sometimes with living twigs unlike the slender caduceus; and the single serpent that entwines itself about it stands for wisdom and also, through the periodical casting of its skin, for immortality.

In our collection there is only one medal shown in which use of the head of Aesculapius has been made. It was modelled in 1923 for Doctor Edward B. Krumbhaar for annual presentation to the medical student of the University of Pennsylvania who distinguishes himself in medical research. The portrait is founded on the head of a Greek statue showing the god with curly hair and beard and has an inscription in Greek which may be freely translated: "For zeal in research."

The memorial in the Philadelphia County Medical Society to members who fell in the great war is correct so far as the symbolism is concerned, showing as it does the serpent and staff carved in wood and gilded, but you will not find it on any of the medals in the case.

The serpent itself was associated with the tripod of the oracle at Delphi, and the idea is used on two of the medals, the first being the one issued at the dedication of the College of Physicians building in which we are now assembled, the other being the "William Wood Gerhard" medal designed for Doctor Arthur Gerhard in 1925, who presented it to the Pathological Society of Philadelphia, the first recipient being William Welch.

In both, the serpent is coiled about the tripod and raises his head to the lamp of learning standing on its top.

Another medical symbol is the mouse which has been associated with the black plague and also with famine. If you look carefully at the reverse of the "William Burns Saunders" medal

designed, in 1929, for distinguished service in nursing, you will see a small mouse perched on the lamp which became the distinguishing symbol of Florence Nightingale, "the lady of the lamp," whose portrait is on the obverse.

Perhaps the greatest discovery in American Medicine was that of ether as an anaesthetic, first employed by Crawford W. Long in 1842.

Long was a graduate of the University of Pennsylvania, and it is fitting that his portrait and a record of his achievement should occupy a place in the Medical Laboratories of that institution. The medal in the case is a reduction of the original 18″ medallion which was unveiled by his daughter in 1911. It shows him using the anaesthetic by dropping it from an open bottle on a towel held over the patient's mouth, the decorative border of the design being made up of poppies.

Every ten years or so the controversy about precedent in the discovery of ether breaks out anew, and we are about due now for another discussion on it, and a rehashing of the old facts and opinions. The facts are simple and clear, however. Long used it at least four years in private practice before any of the other claimants, but Morton first publicly demonstrated it, and so the glory must always be divided.

Some years ago a variant was made for the University of Georgia which also claims Long as an alumnus.

Another medal in the case commemorates the quixotic attempt of a young doctor, also a Pennsylvania graduate, who with his friend, Bolling, a chemist, attempted to set free General Lafayette from his prison-house at Olmutz.

The romantic story of Francis Kinloch Huger, of the class of 1797, has been told many times and it is too long to recount here. The best version was in the *Century* magazine for November, 1911; unfortunately the gallant effort ended in the recapture not only of Lafayette, but also of his two would be rescuers whose necks narrowly escaped the noose.

Of the personal medals of immediate interest to Fellows of the College are those of that great surgeon, W. W. Keen, with his restless hands, one of our own past presidents. This is a reduction from the bronze at Brown University, and only a few copies were made for personal friends.

Another is of our beloved benefactor and past-president, S.

Weir Mitchell, after whom this Hall is named. The first study of the "Mitchell" medal was made in 1909, after viewing a portrait in relief which did not seem to me a satisfactory representation of his thin scholarly face. He kindly consented at my request to sit for me; and I have in my hand the plaster cast of the first sketch I made directly from life.

It was elaborated into a plaque, 28″ × 16″, with an inscription, and a variant was modelled in 1915 for the Franklin Inn club in the same pose.

You will see in the case a reduction of this plaque to 7″, one of 100 copies issued to members of the club and to a few friends.

Two other variants were made later, one with his academic cap on, and a second without it, for the Library of the University of Pennsylvania.

A third medallion is that of another distinguished Fellow of the college, fortunately still with us, Doctor Chevalier Jackson. It was a personal tribute and is inscribed:

"Master of his art."

It was made about ten years ago.

There are three portraits that have an international interest:

1. Sir Robert Jones of Liverpool, with whom I was fortunate enough to be associated for some time during the war, an honorary fellow of the American College of Surgeons and a man who did more to help the cause of orthopaedic surgery than any other single person. This was modelled from life during the scant leisure of inspection trips taken together.

2. The second is that of Sir Arthur Keith, late Conservator of the Museum and Hunterian professor in the Royal College of Surgeons of England, also modelled from life in his laboratory in the summer of 1930.

3. The third is a study of that great medical missionary of Labrador, Sir Wilfred Grenfell, modelled from life as a tribute of affection.

I must not forget two early attempts at friends of Montreal days, William Henry Drummond, much more noted as the poet of the French-Canadian habitant than as a physician; and Doctor Dudley Allen Sargent of Harvard University, to whom I owe much as my first teacher in physical education.

It gives me great pleasure, Mr. President, to turn over to your safe-keeping this collection of medals and this catalogue, containing a full description of them and of other larger pieces either permanently placed elsewhere or too large to put in the small compass of a case like this.

I trust they may serve as a start in the formation of a collection which will eventually be worthy of this great College of Physicians, of which we are so proud.

April 3

THE NERVOUS CONTROL OF THE HEART AND BLOOD VESSELS

By D. W. BRONK, Ph.D.

(*The Johnson Foundation,*
University of Pennsylvania School of Medicine)

The rate of the heart-beat and the caliber of the blood vessels are continually under the control of the central nervous system. Thus, the supply of blood to the various parts of the body is adjusted in accordance with their several needs, and the level of blood pressure is held within fairly narrow limits. In order to determine how this control is achieved, the impulses in the cardiovascular regulatory nerves have been recorded photographically by electrical means.

In the walls of certain blood vessels are sense organs which are stimulated by changes in arterial pressure. These pressure receptors discharge to the central nervous system a volley of nerve impulses with each pulse, the number of impulses increasing with a rise in blood pressure. In this way the centers are kept informed of the frequency of the heart-beat and of the level of arterial pressure. The signaling mechanism is extremely sensitive and faithful and reports every minor fluctuation in those variables.

Arriving at the centers these sensory messages regulate and modify the activity of the nerve cells which keep the vessels in a state of tonic constriction; which accelerate or inhibit the heart. By recording these impulses it has been possible to observe the rhythms of the autonomic nervous system. They are found to be extremely labile and profoundly modified by changes in the chemical composition of the blood, by various humoral agents and by the activity of the respiratory center, as well as by sensory impulses from the circulatory system.

The increased discharge of impulses from the carotid sinus, for instance, which results from a rise in blood pressure, inhibits

the accelerator impulses and increases the inhibitory impulses to the heart; it inhibits the constrictor impulses to the blood vessels. Thus a rise in blood pressure reflexly lowers the blood pressure; an increase in heart rate slows the heart. By investigating these mechanisms with modern physical methods the precision of the control system has been revealed and new factors in the normal and pathological conditions of circulatory regulation have become known.

CERTAIN OBSERVATIONS CONCERNING HYPERTENSION AND ITS TREATMENT

By E. J. G. BEARDSLEY, M.D.

The extreme frequency of the symptom hypertension is indicated, and the apparently increased modern tendency for blood pressure under emotional stress to exhibit elevation at all ages is referred to. A search of the voluminous literature proved disappointing with respect to positive or helpful information as to definite etiological factors, to practical methods of prophylaxis or to efficient plans for successful therapy.

Emphasis is directed to the fact that prevalence of a symptom or of a disease does not, as a rule, lead to clarity of view regarding either. This is well illustrated in remembering that our medical ancestors witnessed blood shed in warfare and in private quarrels for many centuries, but it was not until 1628 that by William Harvey's genius the truth concerning the circulation of the blood became known. There exists no positive and unbiased evidence that the present generation of physicians are intellectually superior to the medical men of the ages past.

There is, perhaps, a tendency to forget or to ignore the vital and important truth that the acquisition and systematization of positive knowledge is the only human activity that is truly cumulative and progressive. We are said with illuminating truth to stand upon the intellectual shoulders of those medical giants of bygone days, and it must be remembered we depend, more than we like to acknowledge, upon the influence of the same unusual type of present day progressives for our medical leadership and inspiration.

To these two powerful influences, and due to no particular medical virtue on the part of most of us, we are able to visualize a little more clearly today's medical problems than past generations of physicians were able to do. To appreciate fully, however, the importance and worth of the accumulated experience and knowledge of past medical ages is to clearly recognize that succeeding generations of physicians will wonder at our obtuse-

ness and lack of understanding of problems that time and scientific discoveries will make clear.

Thirty years experience in observing and studying patients who exhibited varying degrees of hypertension has emphasized the importance of certain features regarding the etiology, practical prophylactic measures and treatment of patients who have this symptom. Heredity and its constitutional legacies, it has been impressed upon my mind, is by far the most important etiological factor in hypertension. Any thoughtful physician, whose vocation deals with human beings and their life problems, and who has had the opportunity to witness the characteristics of grandparents, parents and children, must of necessity be deeply interested and as deeply impressed by the effects of heredity. If a physician, with such opportunities for observation and study is not impressed with the direct and remote effects of heredity as influencing the physical, emotional and moral tendencies of his patients, he must be, it seems to me, both physically and intellectually blind.

It is, however, clearly difficult, if not impossible, to separate the influence of heredity from causative effects of environment when one deals with the results of the "slings and arrows of outrageous fortune."

If one grants a susceptible sympathetic nervous system, acquired by heredity, and adds to this an unfortunate environment, one sees, even very early in life, the beginnings of a functional hypertension. To be able to understand helpfully the early stages of hypertension every physician must, it seems to me, become more interested in the psyche of the patient than has been the general experience of the past.

One of the few advantages that the medical profession has derived from the economic depression has been the undesired and unwelcome opportunity of visualizing the physical and emotional effects of uncertainty, anxiety, worry and fear, with such other psychic ills as hate, jealousy, envy and thwarted love thrown in for good measure. No one is in a better position to seek, to find and to recognize vital truths than is the physician. No one is in a better position to know true values. Can we truthfully state that physicians, with all their knowledge based upon intimately studying life, set an outstanding example to other less favored citizens on how life should be lived?

We have through the labors of many expert investigators in the laboratories learned of the evil effects of the emotions upon every vital organ in the body. The effect of fear, of worry, of anxiety has been made clear to us and we have had, daily, many opportunities of confirming the results obtained in animal experimentation by observing and studying the effects of the unwelcome emotions in unfortunate human subjects. Have not the anxieties and stress wrought by failure to live within one's income, financial or emotional, in competition with one's neighbors proved a more harmful influence in the etiology of hypertension than have the effects of rich food, strong drink or tobacco? Has not every physician observed the evil effects upon the blood pressure in the sensitive woman who, the fates have ordained, shall live in the tense and unhappy atmosphere of a home tainted by the sarcasm and critical attitude of an innately cruel husband? The silent-martyr type of husband or wife, who ascribes to others the reactions of his or her own inherited inferiority complex, brings about tenseness and unhappiness that, in time, cause cardiovascular symptoms. What of the victims, male and female, who must, year in and year out, endure the devastating effects of the struggle for egoistic dominance that causes "nagging" and all its accompanying unhappiness? Does it not appear plain that sane efforts toward the prophylaxis of hypertension and its evils must depend upon the acquisition of a sounder and better philosophy of living?

We all, physician, patient and members of the lay public alike, need to adjust our ideals for success and happiness. Our home lives, our educational system and our National standards for successful living must be improved before we can hope to be a saner, healthier or happier people.

When we think of heredity we, as a rule, consider only our ancestors and conveniently ignore the fact that we too are ancestors and transmit to our progeny germ plasm laden with good or harmful influences.

How may a physician prove most serviceable to the patient who has hypertension?

An understanding, as perfect as may be possible, of the heredity, the environment, the accidents of fate that have affected the patient is quite as necessary as is a study of the physical signs exhibited by the body. Understanding of the patient's back-

ground renders one sympathetic to his present ills, and then an application of the Golden Rule proves helpful therapy. Perfect comprehension of the problem with sympathy and understanding kindness and optimism in outlook fills the patient's emotional needs. Symptomatic treatment by simple, inexpensive and age-old remedies relieves, as a rule, the physical symptoms.

DEVELOPMENT OF THE DIFFERENT LAYERS OF THE CEREBRAL CORTEX WITH REFERENCE TO SOME PATHOLOGICAL CASES. THE FOREBRAIN OF PREHISTORIC RACES

The Mary Scott Newbold Lecture XXXIV.*

By C. U. ARIËNS KAPPERS, M.D., Sc.D.

(*Amsterdam*)

Before dealing with the organization of the cerebral cortex, I shall refer to some principles underlying the structure of the central nervous system in general, especially its sensory centers.

First, I may call the attention to the fact that the sensory centers of the nervous system show the tendency to grow out in the direction of the peripheral impulses that reach them. Thus, the gray matter of the spinal cord of a very low fish, the lamprey, is arranged in two wings only, one on each side of the central canal, each wing containing sensory as well as motor cells. In sharks and higher animals each of these wings divides in two horns, a dorsal and ventral one, the dorsal horn growing out to the very periphery of the cord to the afferent root fibers in the zona marginalis from which it receives its impulses.

A second peculiarity of sensory centers is that they show a tendency to surface extension. With the posterior horns of the spinal cord this is evident in more ways than one. In the first place the posterior horn, as a whole, shows a much greater surface expansion than the motor or anterior column does. This is not as immediately evident in a transverse section as in a spatial reconstruction of a larger part of the cord. But also within the posterior horn the tendency to surface extension is evident, especially in its gelatinous substance, which receives the protopathic impulses. This substance shows a distinct cortex-like arrangement in nearly all mammals, and in some of them (e.g. the Ungulates) it is even folded. The same may be observed in the end-station of the epicritic sense, the nuclei of the posterior funiculi,

* Read before the College, May 1, 1935.

that in several monkeys (*Cebidae* and *Atelidae* especially) are no solid masses but frequently folded structures, with a large surface. Such extension of surface is seen also in the inferior olive of mammals, in the laminar nucleus of reptiles and birds (connected with hearing), in the superior olive, and in the medial and lateral geniculate nuclei. The most evident example of this, more striking even than the cerebral cortex, is the cerebellum, whose thin and frequently folded lamellae are the most typical example of the tendency of surface extension in a receptory or sensory region, the cerebellar cortex being primarily a sensory field.

Contrary to the prevailing tendency in these sensory structures, the centers of motility usually are more clumped, as for example appears in the motor column of the spinal cord and still more evidently in the nuclei of the motor roots that are usually just solid clumps. This difference in the general appearance of sensory and motor centers may be correlated with the different character of the entering and of the outgoing impulses. Impulses that enter our nervous system have sharply discriminated features. The character of the impulses that reach us is very different, even if they belong to the same group, e.g. light or touch. We perceive all sorts of light and all sorts of touch. Besides, each of these impulses, even if the character is the same, may have an other local sign. In short the impulses as they enter our central nervous system are more or less separated entities, although they may become secondarily associated to larger complexes. The outgoing impulse, however, as it runs to a muscle is nearly always what Sherrington has called a "common path," an aggregate of many coordinated impulses running together, consolidated into one effect.

It follows from this that the number of neurones usually decreases from the first or receptory neurone to the second and third neurone, as is best demonstrated by the optic impulses and the cells along which they run. The number of primary recipients of the light impulses, the rods and cones, in one human eye is about 40 million, at the second neurone, the bipolars, the number of conducting elements is about 20 million,* and the third neurone, the optic nerve itself, has less than a million. This shows that even while still in the ascending path of conduction of

* These figures are by Zwanenburg: Quantitalief onderevek van het nepulies, Amsterdam, 1915.

peripheral impulses a diminution of conducting material may occur,* so that the primary impulses in their further conduction must be aggregated to complexes using a common path. The same relation as in the optic system is observed in the conduction of skin and bodily sensations, the number of the sensory root fibers entering the spinal cord being ever so much larger than the number of the secondary neurones in the spinal and medial lemniscus. In the outgoing path the decrease of conducting elements is, not rarely, even more striking, which may account, in part, for the fact that the number of cells in the motor centers is usually relatively small and the cells themselves less widely distributed than are the sensory ones.

If now we return to the spinal cord and see how a simple reflex is transmitted to the muscles, we find even in lower vertebrates that the sensory impulse is usually not directly transmitted to the motor one, but that there are cells intercalated between the posterior root fibers and the motor neurone. Coghill stated in his Cambridge lectures that the coil reflex of the Amblystoma larve cannot be elicited until an intercalated cell has grown out in the floorplate between the afferent and efferent roots. Many other examples could be quoted to show that intercalated neurones are required for transmitting a sensory impulse to a motor center.† Furthermore, intercalated neurones occur also in the spinal cord for commissural connections with the contralateral sensory region. These dorsal commissural fibers are especially conspicuous in birds. In human pathology they play an important part in explaining the phenomenon of allochiria or alloesthesia (c.f. Mott, and especially Dusser de Barenne).

If we draw a simple scheme of impulse transmission in the spinal cord, we may indicate the entering fiber system as in the superficial or marginal zone, underneath it the intercalated cells, and, ventral to the latter, the commissural and efferent cells. The same arrangement prevails throughout the whole nervous system. In the same way, the optic fibers of the midbrain roof, running in the surface of the midbrain roof, transmit their impulses largely by means of small cells to the deeper seated effectory neurones.

* This is not always so! Cajal described a "conduction en avalanche," in which the number of secondary neurones is larger than the primary ones; but this is an exception.

† In further stages of development direct reflex collaterals of the posterior roots penetrate into the anterior horn (*von Lenhossek*).

Only in mammals is there an increase in direct transmission by means of optic collaterals to the efferent cells (*Cajal*).

Studying the structure of the cerebral cortex in its most primitive condition with these facts in mind, we find again the same principles. Starting with amphibians, we see a very simple arrangement of cells in the mantle of the forebrain, most of the cells being still near their ependymal matrix. This is especially evident in the lateral part of the mantle where the impulses acting on them are rather weak, coming from the largely or entirely unmyelinated olfactory tract. There are reasons for accepting the view that impulses in unmyelinated tracts are weaker than those conducted by myelinated fibers. Apparently these weaker impulses have also a lesser neurobiotactic effect. The cells on which these impulses act extend only their dendrites in the direction of the zonal layer in which the olfactory tracts run; their cell bodies have not yet migrated in that direction.

In contrast to the lateral region of the cortex, the medial region contains myelinated afferent fibers in its zonal layer, and in connection with what has been said it is not strange to find that here the cell bodies themselves have shifted to the periphery. It was especially Kuhlenbeck who pointed out the neurobiotactic character of this cell shifting.

Referring for a closer analysis of the cortical relations in amphibia to the recent publications of Herrick on *Necturus,* I pass on to the structure of the reptilian cortex. Here the fundamental principles of cortical arrangement first appear conspicuously and are in conformity with the principles observed in the spinal cord. The pallium of a lizard shows three distinct cortical layers: a medial granular layer; a dorsal pyramidal layer that usually extends for a short distance underneath the granular; and a lateral, also pyramidal layer, separated usually from the dorsal one by a gap or rather an overlapping, so that the lateral layer partly extends over the dorsal one. The two former layers together establish what is called the hippocampus or archicortex; the lateral layer is the piriform cortex of these animals. I shall deal with the hippocampal cortex only, i.e. with the medial granular layer and the dorsal pyramidal one extending partly underneath it. The functional division in these two layers is such that the medial, more superficial, granular layer chiefly acts as a layer of intercalated cells, receiving its impulses from the

zonal fibers. In other words the granular layer is mainly a receptory one, transmitting impulses to adjacent pyramidal cells. These larger lateral pyramidal cells give rise to long effectory tracts, comparable to the human fornix and corticofugal in character. Their cells of origin receive their incoming impulses in part directly, but largely via the intercalating neurones of the granular layer.

Apparently, we find the same fundamental arrangement here as in the spinal cord and tectum opticum: a zonal layer with afferent fibers, and a number of smaller granular cells, transmitting the impulses to the more deeply located larger effectory neurones.

The same relations are found again in the primitive cortical areas of mammals, in the prepiriform cortex of the olfactory lobe as well as in the hippocampal formation.

Furthermore, in the prepiriform cortex of the rabbit, just as in the gelatinous substance of the spinal cord, a surface increase of the receptory region is indicated by the folded character of the granular layer, which lies next to the zonal layer in which the olfactory tract runs. The third neurones, or large efferent cells, are a more clumsy mass of subgranular pyramids, the long effectory axons of which may play a part in the sniffing habits which in these animals accompany the search for food.

In the hippocampal cortex of mammals the relation is fundamentally the same, there being a granular layer and a layer of partly subgranular pyramids; the former consisting of small intercalating neurones; the subgranular pyramids, giving rise to the efferent system of the fornix (and cortico-habenular tract) and also to commissural fibers, the psalterium, that connect the hippocampus of one side with that of the other. The chief difference between the hippocampus of reptiles and of mammals is its folded character in the latter, caused by the outgrowth of the neocortex which, developing on the side of the hippocampus, raises the lateral border of the latter and turns it up in a dorsomedial direction, thus giving the mammalian hippocampus its peculiar form, whence it derives its name in allusion to the twisted tail of a little seafish.

While, thus, the structure of the most primitive cortical areas does not present fundamentally any general principles other than those obtaining in the spinal cord, the development of the visual,

sensory and acoustic cortex introduces a complication that makes it very different from the cortical forms hitherto described. This neocortex is largely responsible for the increase of the brain in higher mammals and man. Yet the increase of the forebrain in general has already begun in amphibia and reptiles and is a consequence of life on land; the further development of the limbs and joints, the proprioceptive sense in general and the finer adjustment of the limbs play a large part in this. Furthermore, life on land, i.e. in the air, causes the ear to develop, while vision, no longer hampered by the dim light in the water, also improves. Whereas fishes are practically deaf and their fins are hardly more than propellers to move their bodies, in the frog hearing has developed and the limbs are being used for standing and grasping. To what degree vision may improve in aerial life appears from the amazing visual capacities of birds.

This improvement in discrimination in general and the corresponding neokinetic motility are the chief causes of the increase of the brain. But here the question arises, why do these senses finally all become connected with the forebrain, why does the neocortex develop on the forebrain, why not on the midbrain (so much larger in some lower animals) or in some other spot of the central nervous system?

We do not know with certainty the reason for this fact, but there are a few points that may help to explain it. The first is that the forebrain is the center of smell, and smell itself is a very exactly discriminating function even in lower animals, as is proved by the fact, stated by Zwaardemaker, that some animals may smell quantities of odorific substances 250 times smaller than may be demonstrated by spectral analysis. That the other impulses associate with smell, i.e. with the forebrain, is explained by Sherrington by the fact that the original forebrain is, by reason of its function, smell, a *distance receptor*. Objects are smelled by animals at very great distances, long before they may be seen or touched. Now, it is a well known fact in physiology (Sherrington, Magnus), as well as in psychology (v. d. Waals), that the preceding impulse determines the ending of the following ones. Hence, if an object is first smelled, then seen and finally touched, the subsequent impulses will tend to associate with the spot where the first impulse arrived, i.e. with the center of smell, the forebrain.

Returning to the structure of those neocortical regions, the visual, sensory and auditory areas, we find that they differ from the olfactory cortex by an ever increasing amount of associative cells. Only the first embryonic stages of the neocortex remind us of the arrangement in the olfactory cortex of the frog, all the cells being located in a ventricular matrix. Later, some of these matrix cells shift in the direction of the zonal layer. Still later an arrangement in different laminae is observed. In this stage the neocortex is already much thicker than the olfactory cortex. In *Dasypus* at birth, in man even in a prenatal stage (Brodmann), it consists of five cell-layers, showing a granular layer (IV) in the middle and two layers of larger cells above and beneath this granular layer. The supragranular layers (III and II) develop from the primitive granular layer (IV).

These five cell-layers, however, may be classified in three groups: the supragranular cells (layers II and III of Brodmann), the granular layer (IV of Brodmann), and the subgranular cells (V and VI of Brodmann); and the relation of these groups of neocortical layers to the two layers of the olfactory cortex forms is such that the granular layer (IV) of the neocortex, together with the supragranular cells (III and II), are homologous to the granular layer of the olfactory cortex, while the large subgranular cells (V and VI) of the neocortex are homologous to the deep pyramidal cells of the olfactory cortex. The laminar homology of the large cells (V and VI) of the neocortex to the deep pyramids of the olfactory cortex appears from the fact that the deep pyramids of the olfactory cortex are continuous with the large subgranular cells of the neocortex. Moreover, the efferent and commissural function of the subgranular pyramids, so typical of the olfactory cortex, is proved for the neocortex by the fact that cutting the corpus callosum (van Valkenburg, I. de Vries) or the centrifugal tracts (Holmes and Nissl) causes a degeneration only of the subgranular pyramids. Lesions of the supragranular pyramidal layers cause only a temporary impairment of finer movements, no lasting motor defect (Dusser de Barenne, 1934). They do not give corticofugal degenerations.*

The homology of the neocortical granular layer (IV) with the granules of the olfactory cortex is indicated by the fact that in

* Yet a few callosum fibers may also originate here (Lorente de No and Villaverde). A real motor defect and corticofugal degeneration, however, results only from lesions of the subgranular pyramids.

both cases they lie immediately above the subgranular pyramids. That the receptive-correlative function of these granular layers is the same in both the olfactory cortex and neocortex appears from the fact that the granular layer is best developed in those regions of the neocortex that have an exquisite sensory function, the postcentral or sensory region, the frontal cortex (which receives fibres from the nucleus ruber), the auditory and visual cortex. In the visual cortex of primates and man there is even a doubling of the granular layer, and the optic radiation runs in the stria Gennari or Vicq d'Azyr between these two granular layers. Only a few fibres may end in deeper layers (Poljak). In the neocortex, however, the granular layer (IV) is not the only one which receives afferent impulses. In the neocortex the majority of the efferent impulses reach the supragranular pyramids, which are developed from the granular layer, acquiring larger cell-bodies and developing longer neurites. This development of supragranular pyramids out of the granular layer does not occur in the olfactory cortex.*

The more recent character of the supragranular pyramids of the neocortex and their development at the expense of granular cells can also be noted ontogenetically, since this layer is the last to develop and arises by an increase in volume of a part of the granular layer. Its development at the expense of the granular layer has been proved (van't Hoog) also by comparing the same cortical field in closely related mammals, differing in size, as cat and tiger, gazelle and elk, or small and large monkeys of the same family. It then appears that in the larger of the two animals the supragranular pyramids are increased at the expense of the granular layer. This increase of large cells at the expense of the smaller ones † is correlated with the larger outgrowth of their neurites in the larger brains, where the intracortical association fibers are naturally longer than the homologous fibers in small brains.

That the supragranular pyramids, in addition to receptive-integrative functions, have associative functions appears from the fact that the callosal fibers end in this layer (van Valkenburg).

* The few pyramidal cells, continuing the fascia dentata of lizards dorsolaterally, and receiving fibres of the zonal layer, are the only indication of such a process in these animals.

† Faintly indicated in the fascia dentata of the lizard; see footnote, preceding page.

Their associative character is however most evident from the fact, first observed by Mott and confirmed by van't Hoog, that in higher mammals, anthropoids and man, the supragranular layer increases to a much greater extent than the effectory subgranular layer.

The development of the supragranular pyramids, at the expense of the granular cells, implies that we have to consider these granular cells as a germinal matrix of association cells.

Considering that the life of ganglion cells depends, more than with many other types of cells, on oxygen metabolism.* It is evident that the inherent character of their granules also involves great metabolic activity, which is indicated, as emphasized by Edw. Horne Craigie of Toronto and by Pfeiffer's work on the vascularisation of the cortex, by the fact that the granular layer has by far the greatest blood supply. The next greatest blood supply is in the supragranular pyramids (III). This again agrees with the observation, made by Mott and his collaborators, that the granules contain a large amount of oxydases, oxygen transporting enzymes. Considering the high metabolism of these layers, it is not strange that in such a disease as dementia precox, which is characterized by a lowered metabolic rate (Pighini, Bowman, Claude, Baruk, Medakovitch, Hoskins) and periodic deficiencies in thyroid activity (Gjessing), the supragranular pyramids (layer III) show symptoms of a lack of vitality, resulting in non inflammatory, merely degenerative atrophy (Nissl, Alzheimer, Josephy, Naito, K. H. Bouman, Spielmeyer). K. H. Bouman especially has called attention to the apparent lack of vitality of this layer in dementia precox, which agrees with Mott's observations concerning phosphorus deficiency in these cells and a prevalence of oxychromatin above basichromatin in their nuclei, confirmed by Freeman's observation on iron deficiency, and the thinness of the nucleolus and nuclear membranes in the supra- (and infra-) granular pyramids. The fact, moreover, that administration of CO_2 plus O_2 (Lorenz, Loevenhart and Waters, Leah, Lurie, Le Blanc, Kellman) or of thyroid, increasing the metabolic rate (Gjessing), may give a temporary relief of cato-

* The great need of oxygen metabolism in nerve cells is well expressed by the fact that each ganglion cell of an insect receives one or more tracheoles (Ross and Tassel) and also by the extension of dendrites to the pia in such spinal cords as have no intramedullary vascularisation, but only supramedullary blood vessels. It furthermore appears from the fact (Spielmeyer) that arterial spasms of even short duration may cause necrosis of ganglion cells.

tonic stuporous symptoms, shows the importance of normal metabolism for the functional fitness of the cortex in such patients.

The fact, reported by Dunlap, Spielmeyer and others, that cortical changes analogous to those seen in dementia precox are also observed occasionally in so called normal people, killed by accident, or in soldiers and executed prisoners, only proves that analogous changes may occur without (or perhaps before) the appearance of dementia precox. Spielmeyer himself did not deny that the atrophic patches in the III (and occasionally V) layer, sometimes with an enormous accumulation of fat, should be considered as related to this disease, the organic character of which appears also from the fatty degenerations in other organs, such as the interstitial cells of the ovaries and testes and the sexual cells themselves (Mott, Kojima, Prados Y Such).

The specific vulnerability of the supragranular pyramids is shown also in the interesting studies on asphyxia published by Yant, Chornyak, Schrenk, Patty and Sayers.* Dr. Ziegler, of Albany, called my attention to the fact that this layer is also especially involved in alcohol poisoning. As the same tendency occurs in general paralysis, this explains the fact that alcoholism favors cerebral destruction in that disease.

That the supragranular pyramids are closely connected with the internal granular layer and more or less independent from the subgranular layers, appears also from the interesting changes observed by Nieuwenhuyse in microgyria, in which the subgranular layers were normal, while the granular layer together with the supragranular layer took part in the papilliform proliferations of the cortex that cause the frequently folded character of the convolutions in this disease.

There remain a great number of questions as to the intrinsic connections of the human cortex especially with respect to the structure and function of the various cytotectonic areas in health and disease. Time, however, does not allow me to enter into this matter. I will only allude briefly to two problems important to anatomists: first, the influence of fissures on the cytectonic structure of the cortex; and second, the influence of cytotectonic structures on the fissures.

* Yant, W. P., Chornyak, J., Schrenk, H. H., Patty, F. A. and Sayers, R. R. Studies in Asphyxia. U. S. Pub. Health Bull., No. 211, Washington, D. C., 1934.

As concerns the influence of the fissures on the cytotectonic structure of the cortex, it is important to realize that within the same cortical area the relative depths of the supragranular and subgranular pyramidal layers at the bottom of the fissures differs from their relative depths on top of the convolutions. Bok has shown that the expansion of the superficial layer and the compression of the deeper one on the top of a convolution makes the supragranular layer flatter and less deep and the subgranular layer much deeper. The reverse is seen at the bottom of the fissures, where the supragranular layer is compressed and consequently thicker, and the subgranular one extended and consequently thinner.

The second point, the influences of the cortical regions on the fissures, is especially interesting in the study of the brain or endocranial casts of prehistoric races. Nowadays the study of brain fissuration is nearly obsolete. The more important studies on its histological relations have reduced the interest in the external morphology of the brain to a mere problem of dissecting-room anatomy.

And yet we may not neglect the surface anatomy of the brain, be it only for the reason that the surface anatomy of the brain is the only way to acquire some knowledge about the brains of our prehistoric ancestors. I shall, therefore, add a few words about the significance of the fissures of the brain in relation to the cytotectonic fields. I shall do this only for the convexity of the frontal and occipital lobes, as these are usually the only parts of an endocranial cast on which impressions of the convolutions and fissures are well indicated, a consequence of the fact that these parts are more nearly adjacent to the skull than are the dorral parts of the brain, which are separated from it by a larger amount of cerebrospinal fluid.

Before dealing with these lobes I may remind you that the folding of the cortex is the consequence of its tendency to surface extension to which I alluded at the beginning. There is however still another reason for this folding, a reason pointed out by Baillarger, who emphasized that if the volume of a brain increases, this increase is as the cube, while its surface (if it remained smooth) would increase only as the square. So if the enlargement of surface is to keep pace with the enlargement of volume this surface cannot remain smooth, but has to fold. Naturally this

tendency to fold may also increase from an intrinsic development of the cortex itself, independent of the size of the animal; just as the supragranular layers increase not only on account of the size of an animal but also on account of its higher position in the scale.

The question now arises, where in the cortex will the folding occur, i.e. which places will develop fissures. Theoretically two places are predisposed toward this process: first, those places where the cortex is thin and may easily give away to pressure. The foldings occurring in such a cortex are *axial fissures,* i.e. they lie inside one typical cortical field. Examples of this are the hippocampal folding, mentioned before, and the folding of the visual cortex round the calcarine fissure. In these parts of the brain mantle the cortex is thin, and the underlying ventricles easily allow an infolding.

These furrows have a topognostic value: wherever they are found we may safely conclude that there is an olfactory cortex and a visual cortex, and we may draw conclusions as to the extent of these cortical areas. Unfortunately, these fissures never give impressions on the endocranial cast of a prehistoric skull, for they lie on the mesial side of the hemispheres and consequently are not in contact with the skull.

There is, however, another way in which fissures may develop, namely, at the borderline between two very different cytotectonic fields, each of which is more or less fixed in its position. Such fissures are not axial but *limiting fissures.* If two adjacent fields of the cortex are very different in structure, they usually are also very different in a mechanical, dynamic sense, and enlargement of one or both of them may give rise to a groove in between the two fields. We then have to do with a limiting groove.

Such limiting fissures occur on the convexity of the brain, i.e. on that part of the brain which may be shown on an endocranial cast. Thus, on the occipital lobe the Simian fissure, or its fundamental constituent, the lunate sulcus of *Elliot Smith,* establishes approximately the lateral anterior border of the visual field, the limit between the visuo-sensory (17) and the visuo-psychic area (18 and 19) of Brodmann. On the central lobe the Rolandic fissure is a limiting fissure, and so on the frontal lobe are the precentral and the inferior frontal fissures.

Especially the last named fissures are important for evaluat-

ing the development of a brain; the precentral fissure being the caudal limit of the frontal area, and the inferior frontal sulcus, the borderline between the speech center and the center for movement-correlation (including the center for circumspection). Inasmuch as the extension and organization of the frontal lobe is very important for the degree of development of the brain in mammals and man, it is very fortunate that indications of these fissures are often found on endocranial casts of prehistoric skulls; in addition, several minor fissures in this region, though not exactly at border lines, help us to infer from the surface morphology of the cast whether we have to do with the brain of an ape, or man, or of an intermediate stage of development.

Comparing the endocranial casts of *Pithecanthropus* (Dubois' apeman from Java), Black's *Sinanthropus pekinensis*, Neanderthal casts and endocranial casts of the upper paleolithic or "reindeer" race, we not only find differences in the volume of the brain and in its height but also a change of fissuration. The location of the lunate sulcus of the lambda suture of *Pithecanthropus,* as well as the course of its frontal fissures, shows that the apeman from Java was essentially chimpanzoid, while Black's *Sinanthropus* was apparently human, but more primitive even than the Neanderthal man, from which it differs also by having a much smaller brain volume (960 c.c.; the Neanderthal man has 1400 c.c.). The difference between the endocranial casts of the extinct Neanderthal race and of the upper paleolithic man (of the reindeer period) lies in the greater height of the latter's brain and in the further development of the second frontal and of the inferior frontal convolutions. On the endocranial casts of the reindeer race we find a distinct limitation of the triangular operculum, the speech center; and the foot of the mid-frontal convolution, the center of circumspection, shows a subdivision and dorsal displacement of mid-frontal fissures; not so distinctly expressed in Neanderthal brains, but closely resembling the relations in the brain of living human races.

Indeed the prehistoric reindeer man of Chancelade, Cro-Magnon and Combe Capelle, who made those beautiful mural paintings in the caves and rock shelters of southern France some 50,000 years ago, may be still represented by the present reindeer man, the Eskimo, who, following the retreat of his reindeer herds, finally reached the arctic regions.

PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY

(*These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.*)

January 17

Dr. William Zentmayer: "History of the Operative Treatment of Detachment of the Retina."

Dr. Perce DeLong: "Microscopic Pathology of Retinal Detachment."

Dr. Edmund B. Spaeth and Dr. Perce DeLong: "Certain Factors in the Physiology and Microscopy of the Reattached Retina."

February 21

Dr. C. E. G. Shannon: Memoir of Dr. Howard Forde Hansell.

Dr. W. S. Reese: "Convergent Concomitant Squint of Paralytic Origin." Exhibition of Case. Discussion by: Dr. Zentmayer.

Dr. A. G. Fewell and (by invitation) *Dr. W. E. Fry:* "Bilateral Glioma of the Retina. A Clinical and Pathological Study." Discussion by: Dr. Zentmayer.

D. C. E. G. Shannon: "Retinal Blastoma. A Preliminary Report." Discussion by: Dr. Andrews, Dr. Fewell, Dr. Zentmayer and Dr. Holloway.

Dr. Francis Heed Adler and (by invitation) *Dr. George E. Berner and Dr. George P. Meyer:* "A Comparison of Tonometers for their Clinical Accuracy." Discussion by: Dr. Meyer, Dr. Adler and Dr. Holloway.

March 21

Dr. William Zentmayer: "Voluntary Control of Accommodation."

Dr. W. S. Reese: "Voluntary Control of Accommodation for Distance." Exhibition of Case. Discussion by: Dr. Cowan and Dr. Langdon.

Dr. W. E. Fry (by invitation): "Low Viscosity Nitrocellulose as an Embedding Medium for Eyes."

Dr. Hunter W. Scarlett: "Shoemaker's Modification of the Motais Operation for Bilateral Congenital Ptosis of the Lids." Exihibition of Case.

Dr. L. F. Appleman: "A Further Report on Intra-capsular Extraction." Discussion by: Dr. Holloway, Dr. Cross and Dr. Appleman.

Dr. E. B. Spaeth: "Mucous Membrane Graft for Symblepharon. Pedicle Flap Blepharoplasty." Moving Pictures. Discussion by: Dr. Cross, Dr. Holloway and Dr. Spaeth.

April 18

Dr. Webb W. Weeks, New York (by invitation): "Concerning After Cataract."

Prof. Dr. Karl Lindner, Vienna (by invitation): "Concerning Intra-Ocular Infection after Operation."

PROCEEDINGS OF THE SECTION ON OTOLARYNGOLOGY

January 16

(Meeting with the Section on Otolaryngology of the New York Academy of Medicine)

Some Phases of Blood Reactions in Acute Infections of the Ear, Nose and Throat. By Dr. Max M. Strumia.

For the time being, may I say that whereas the nuclear shift (or Schilling index) is of great value in the diagnosis of middle ear infection, it is not alone of much importance in the prognosis. For prognosis the best, although not the only, index is the ratio between living and dead neutrophiles, meaning by dead those that show evidence of nuclear degeneration. Generally speaking, up to 5 per cent the toxemia is very slight or practically absent, from 5 to 10 per cent slight, from 10 to 20 per cent moderate, from 20 to 30 or 35 per cent severe. More than 35 per cent degenerated nuclei usually means unfavorable or at least reserved prognosis. In our series no patient who had more than 35 per cent nuclear degeneration for three successive days survived.

Discussion: *Dr. Frederick A. Hemsath,* New York City (by invitation): Dr. Strumia has not laid great stress on the Schilling index and does not seem to feel that we can place reliance on the number of segmented and non-segmented forms in the blood stream as a prognostic index. In regard to the significance of the hyperchromatic granules, it would seem best to reserve judgment, for it is not yet clear what their presence really means. They are seen in cases of toxemia. They are present in carcinoma, and some say they are seen in bone marrow. However, I am not acquainted with them from my own work on nuclear degeneration. There may be a serious drawback to interpretation by the rise in per cent of leukocytes, as this may be only temporary. I, therefore, feel that this is no accurate aid in prognosis. Dr. Strumia has given us some indication of a more trustworthy index in nuclear degeneration. This seems to follow closely the clinical signs, while other tests lag behind.

Dr. Strumia: I would like to add that in only 1 of the 112 cases did the blood picture lag behind the clinical picture. If the blood picture showed lag, it would only be a confirmation. I feel that if this work is done consecutively and well it will be of value. If the degenera-

tive forms should stay high, beyond 35 per cent for 2 or 3 days, then the prognosis is not good.

The Venous Channels of the Base of the Skull and Their Relation to Otolaryngology. By Dr. Oscar V. Batson.

A consideration of the veins and sinuses of the head, particularly at the base of the skull, shows the entire system to be of plexiform character with many named channels, commonly overlooked, and the various parts containing many plexiform by-passes. The venous system of the area is dual in character, consisting of vascular by-passes and veins, concerned with the direct drainage of the tissues. Variation in the part of the system involved in infection would give totally different clinical pictures. The practised procedure of ligation probably does not depend for its success upon the isolation of the vessel, but probably upon the concomitant surgical drainage. This last point is further illustrated by considering the many variations in the manner of union of the common facial with the internal or external jugular and the almost constant communicating channel between these communicating vessels.

Discussion: *Dr. Wm. Rogers,* New York (by invitation): I would like to emphasize a few points relative to the cerebral veins, so important in osteomyelitis and so beautifully shown from the case of Paget's disease. A chronic sinus may produce an intracranial complication, as explained by the venous drainage. All the upper sinuses have a network of veins, which drain into the facial and ophthalmic veins. The posterior and inferior group of sinus veins drain into the pterygoid plexus of veins and the smaller spheno-palatine veins, also some of the small veins traversing the foramen lacerum to the cavernous sinus. Some of these also drain with the petrosquamosal veins and thence into the cavernous sinus. In children of 7, 8 or 9 years there is a vein shown in the specimen traversing the foramen cecum from the anterior nasal region and emptying into the superior longitudinal sinus.

Defective Surgical Instruments as an Avoidable Cause of Foreign Body Accidents. By Dr. Chevalier Jackson.

Pieces of nasal rasp occurring as foreign body in the bronchi in three instances indicate that the breaking of nasal rasps is not a rare accident, because it is highly probable that there were many more cases in which the fragment did not reach a bronchus.

Examination of all three pieces of nasal rasp showed that they were hardened, as the steel worker calls it, "glass hard." Such a

temper is necessary to file iron and not necessary for the rasping of human bone. There is no objection to leaving the teeth hard provided the back of the instrument has the temper drawn. It seems that no safely tempered rasps are on sale in the shops.

A fragment of a tonsil knife removed from the bronchus, after perfectly proper use of the instrument, indicates that these instruments are faulty. On testing this piece of tonsil knife it was found to be tempered "glass hard" throughout. There was no reason whatever for not drawing the temper on the back of the knife and especially at the angle where the breakage occurred. In another case a probe-pointed bistoury broke during a tracheotomy, and the fragment went down into the right bronchus. In another case the catch on a tonsil forceps broke.

The surgeon who is so unfortunate as to encounter breakage of an instrument with foreign-body lodgement should remember that he is not responsible for the accident, but he is responsible for negligence. Therefore, the patient should be immediately informed of the accident and proper steps taken according to indications.

In case the roentgenogram should show the foreign body in a bronchus it should be removed, not necessarily the same day, but a week or two should not elapse if possible to avoid it. If the lost fragment has passed into the stomach, it should be observed daily with the fluoroscope in its passage through the intestines. No cathartics should be given and no change should be made in diet. So long as the foreign body keeps moving it is safe. If it should lodge for more than 4 or 5 days in one position in the intestines, the matter of external operation should be considered.

If an instrument is found to have been bent it should be sent to the instrument maker to be entirely replaced with a new part that has never been bent cold.

Discussion: *Dr. Chas. J. Imperatori,* New York (by invitation).

February 20

Benzyl Methyl Carbinamine (Benzedrine N.N.R.): a Study of the Rapidity and Duration of its Shrinking Action on the Nasal Turbinates. By Dr. A. A. S. Giordano.

A clinical study was made to determine the extent, rapidity and duration of the shrinkage of nasal turbinates affected by

applications of benzyl methyl carbinamine (Benzedrine N.N.R.). Sixty-four rhinological cases were closely observed after applications of the drug. Maximum shrinkage was effected in 93.7 per cent of the cases in an average time of 5.9 minutes. The immediate reactions following the use of the drug compare favorably with those following the use of ordinary solutions of ephedrine.

The duration of shrinkage was studied in 90 normal noses. Benzedrine in a 1 per cent oil solution and in the form of an inhaler gave a shrinkage which lasted approximately 18 per cent longer than that following applications of a 1 per cent oil solution of ephedrine.

The Use of Benzedrine in the Eustachian Tube and Middle Ear; with Apparatus for its Application. By Dr. Earl LeRoy Wood (by invitation).

The beneficial effects of benzedrine vapor in the eustachian tube and middle ear were suggested. Attachments for use with the benzedrine inhaler and ordinary eustachian catheter and the air supply were described.

Review of the Clinical Picture of Suppuration of the Petrous Pyramid. By Dr. Curtis C. Eves and Dr. E. Frank Hooker (by invitation).

Suppuration of the petrous pyramid is the most recently recognized complication of purulent otitis media. It is a definite clinical entity to be differentiated from Gradenigo's syndrome, as proved by studies of recovered cases and autopsy findings. The condition is a result of extension of the pathological otitic process by one or more of several cellular pathways into the petrous pyramid. The natural relation of the involved anatomical structures produces the characteristic symptoms of aural discharge (continuous or reappearing), eye and temporo-parietal pain, abducens paralysis, perilabyrinthine symptoms (vertigo, nystagmus, nausea and vomiting) and increasing nervous irritability. Other frequent diagnostic aids are low-grade septic temperature, subacute blood picture, facial weakness, normal or slightly pathological spinal fluid and a progressive series of roentgen-ray studies. A characteristic case was reported from the author's practice, with a review of 111 other cases, confirming the definite clinical picture as outlined.

March 20

Vestibular Tests: their Practical Application. By Dr. Benjamin H. Shuster.

Vestibular tests are not utilized as frequently nor with as much confidence as they deserve. Presumably disappointments following overenthusiasm account for the pendulum swinging that way. The complexity of these tests has been exaggerated. One need only memorize the few simple tests and the normal reactions, together with the significance of a few abnormal ones, and so be prepared to make use of them. There is also a wrong impression among otologists that the vestibular tests are of value only in the diagnosis of intracranial lesions. It seems to me, however, that the otologist can utilize the tests in many ways in the otological field without ever bothering to apply them in neurogical diagnosis.

In the application of these tests in otology one need but take into consideration:

1. Hypoactivity—the diminution of any or all the normal responses. When there is an impairment of hearing, of the nerve type, the corresponding impairment of the vestibular function serves as an objective confirmation of the nerve character of the deafness. This is desirable when malingering is suspected. Certain diseases and drugs have a predilection for the eighth nerve; thus syphilis, diabetes, meningitis or quinine may have their effects objectively demonstrated in depressed vestibular function. When one bears in mind that the same end-artery to the vertical canals of the labyrinth supplies also that part of the cochlea in which high-pitch sounds are perceived, it is plain that the cause of a dizziness may be suspected as being arteriosclerotic. The symptoms grouped as Ménière's syndrome may in this way also be shown to be of circulatory disturbance.

2. The absence of vestibular responses on one side is another valuable finding. It is utilized in patients who have had signs of labyrinthitis or to determine whether that labyrinthitis was of purulent or serous type. With the return of some of the vestibular function one is not likely to believe the disease to have been suppurative and would be deterred from operating on the labyrinth. Before a radical operation on the mastoid, knowledge of the condition of the labyrinth is of utmost importance. Demonstration of an erosion into an active labyrinth during operation

calls for avoidance of further entering, while in a dead one a labyrinthectomy may be indicated. A dead labyrinth in an unconscious individual, suspected of otitic brain abscess, may point to the abscess as being in the cerebellum rather than in the cerebrum. The labyrinth is a frequent route of origin for a cerebellar abscess.

3. Hyperactivity of the labyrinth may be utilized chiefly in the determination of the cause of vertigo. A chronic ear infection with hyperactive vestibular phenomena may indicate a perilabyrinthitis and hurry the decision to perform a radical mastoidectomy.

In the diagnosis of intra-cranial lesions most of the information is empirical and based on signs which have previously, but not always, proven to indicate such lesions. It is possible for a brain lesion to exist and no vestibular signs to be present. We have also had cases in which the only signs of an intracranial lesion were the vestibular ones, and months later other neurological data were found. It is possible that temporary intracranial conditions may produce vestibular signs. Before attempting to diagnose lesions the normal response should be remembered with facility. When the responses are normal or slightly diminished or exaggerated they add nothing to the picture even though neurogical signs are definite. There are important positive findings which suggest an intracranial lesion, and some which are less certain but nevertheless suggestive. Then there are combinations of findings suggestive of the location of the lesion.

In conclusion, there is enough value in the vestibular tests to justify their serious consideration by the otologist and neurologist.

Discussion: *Dr. Geo. M. Coates:* One reason the vestibular tests are not more widely used is that the average otologist does not know what all this is about. The nerve pathways and normal responses are not sufficiently memorized. If one masters these fundamentals and will use the standard tests, it is not hard to interpret the useful findings. It is hard to malinger the vestibular tests. This was shown in examining aviators for the army, when we got a number of unusual responses but found that they were produced intentionally. I would like to ask what are the relative values of caloric and turning tests, besides convenience and for differentiation of the canals. Does the Cobrac method supersede the other methods now used?

Dr. Sacks: The history of vestibular tests is interesting. Dr. Bárány, in 1905, found in the course of douching ears with water, too hot and too cold, that certain regular responses were produced. On

the operating table, with decompression cases, by chilling the cerebellar lobes, certain other responses were obtained. Nystagmus and past-pointing as a result of these tests were found to be the regular result of certain stimuli. In 1915, Dr. Bárány was awarded the Nobel prize for his work. These primitive tests showed that the ear has a kinetic and static function, as well as that for the perception of sound.

Dr. Robt. J. Hunter: Since we have had the history of this subject mentioned, we should give credit to one of our Fellows of the College, the late Dr. Theodore Weisenburg, who introduced this method of testing the labyrinth into America and first used it here in conjunction with Dr. Mills. Weisenburg selected Isaac Jones, who with the late Dr. Fischer popularized it in this city. One reason why the Bárány test has fallen into disrepute is because the men, who early used it in practice, have been too dogmatic in their interpretations and have not given due thought to the numerous nerve connections of the vestibular system with other parts of the body. My plea is, do not give up at once if certain responses can not be explained, but realize our lack of knowledge of nerve relationships.

Dr. Shuster: In regard to Dr. Coates' questions: the malingerer might fake the past-pointing but he could not control nystagmus. It is interesting that pigeons, subjected to repeated turnings, showed lessened amount of nystagmus. As to the relative value of the tests: mass irrigation would be my one choice, but the responses from turning follow different nerve paths and may show when the caloric tests will not. The Cobrac method of caloric testing is only for quick office procedure. Five or ten cc. of water is used in a small syringe.

Drs. Slotkin, Wahl, Zacs and Philip Stout.

A Review of the Aural and Orbital Complications of Scarlet Fever at the Philadelphia Hospital for Contagious Diseases from 1922 to 1934. By Dr. Horace J. Williams.

Scarlet fever produces more cases of acute otitis media than does any other specific disease in this community. If we may except lymphadenitis in general and serum reaction in those patients who receive serum, we may also safely say that acute otitis media is the most frequent, as well as the most important complication of scarlet fever. In 12 years, 1922 to 1934, 29,298 scarlet fever patients were cared for at the hospital. Of these, 9.9 per cent developed acute suppurative otitis media. Approximately one third of the patients who developed a running ear had a bilateral affection. The mortality for the mastoid patients was 35, or 9.6 per cent. As regards myringotomy, the writer does not favor repeated incisions of the ear drums, as he feels that the bulging of the tympanic membrane which invites repeated incision usually is due to swelling and edema of the mucosa of

the middle ear. Repeated incision inflicts useless trauma on the tympanic membrane and middle ear structures. About 90 per cent of otitic patients in scarlet fever are under 11 years of age. It has been stated by Borden, with whom the writer concurs, that in scarlet fever aural complications of any degree of severity may arise at any time from the first day of acute symptoms to the last day of convalescence. The average number of days of otorrhea was 36 for a series of 1915 consecutive ears that became dry in the hospital without mastoidectomy. The nose and throat are undoubtedly the foci of infection in scarlet fever, and the presence of tonsils and adenoids contributes to the severity of the infection. Infection may reach the middle ear by way of the blood stream. In such case an effective therapeutic method for controlling the nasopharyngeal and anginal infection would still circumvent the development of suppurative otitis media. Orbital cellulitis is most frequently due to disease of the paranasal sinuses in scarlet fever. In children it is most often due to ethmoiditis. In adults the frontal sinus is most frequently the seat of the infection. In a series of fifty cases of orbital cellulitis, 45 of the patients were children and five were adults. In 17 the cellulitis started in the first week of morbidity; 14 started in the second; 10 started in the third; one each started in the fourth, fifth and sixth. With children the conservative method of treatment can always be followed early until the condition subsides or abscess formation occurs.

Discussion: *Dr. Pascal Lucchesi:* Dr. Williams' statement that "acute suppurative otitis media is the most important complication of scarlet fever" might not go unchallenged if made in the presence of cardiologists or pediatrists. It is apropos at this gathering, and I am sure you will all agree with him.

The incidence of otitis media during this twelve year period, among 29,298 scarlet fever patients, is 2898 or 9.9 per cent with a death-rate of 3.7 per cent. We must not forget that scarlet fever, like many other contagious diseases, presents seasonal prevalence. The death-rate seems a little high, especially when we consider that the death-rate of scarlet fever in general is about 1.2 per cent. As a rule some other condition such as meningitis, brain abscess, sinus thrombosis, or broncho-pneumonia is the immediate cause of death. The interval to recovery of 47 days also seems a long time, but these infections caused by the *Streptococcus scarlatinae* are more virulent than those which are met in daily practice.

The incidence of mastoiditis in this study is based on the number operated upon. It is safe to say that almost all patients with scarlet fever, having a discharging ear for three or more weeks, have mastoid

disease. At the Contagious Hospital all mastoids opened showed mastoid disease either of the destructive or sclerotic variety. Dr. Williams was somewhat disappointed at the incidence of acute otitis media in those who received scarlet fever antitoxin. However, it must not be forgotten that no control study was made in this series. I have four slides showing a study of more than 5000 cases. I believe you can see from these slides that the incidence of otitis media and mastoiditis is less in the serum treated group. This is especially noted in the severe cases of the serum treated group.

With reference to orbital cellulitis complicating scarlet fever, the most impressive thing to my mind is the marvelous response of these children to local treatment.

Dr. Geo. M. Coates: I am glad Dr. Williams has brought his statistical study up to date and that the general feeling as to treatment is to avoid complications.

Dr. James A. Babbitt: I feel that we are on the threshold, but can not yet determine accurately what ears should be opened and what mastoids should be operated on. I think Dr. Williams has the opportunity to do some fine research on this problem.

Dr. McFarland: I would like to ask if Dr. Williams has any data on the incidence of deafness?

Dr. Horace Williams: I have no data about the early serous type of otitis media. It seems best, however, to open these ears early, even though the discharge is only serous. As to the incidence of deafness, we have no statistics, but my impression is that there is greater impairment with measles than with scarlet fever.

Chronic Inflammatory Lesions of the True Vocal Cords; Observations on Diagnosis and Treatment. By Dr. Gabriel Tucker.

Discussion: *Drs. K. M. Houser, James M. Babbitt, Wahl, N. M. Levin and Furlong.*

April 17

Streptococcic Meningitis of Otitic Origin, with Recovery. By Dr. Karl M. Houser.

A ten year-old boy, three weeks before admission to the hospital, complained of left-sided earache, which followed an attack of grippe and rhinitis. The pain was relieved by drops. A week later he complained of headache and ear-ache. The doctor told the family that he believed the boy was developing mastoiditis and that there was an abscess in the ear but that it would eventually open itself. No drainage occurred from the ear and there was vomiting of projectile type. Cervical rigidity developed. The left tympanic membrane was red and bulging. Mastoid

tenderness was not present. Lumbar puncture yielded five cc. of cloudy fluid. This fluid contained 1250 cells, and culture on the following day was positive for *Streptococcus anginosus.*

Simple mastoidectomy and myringotomy were performed. The mastoid cell walls were intact but soft, and no free pus was found. The day after operation marked improvement of the boy's condition had occurred. His headache and vomiting disappeared, and the cervical rigidity could not be demonstrated. We know that sometime between his operation on January 17 at 1:50 P.M. and January 18 at 1 P.M. the organism disappeared from the spinal fluid. From this time until his discharge from the Hospital on February 11, 1935, his convalescence was steady. This case is presented as an inexplicable oddity. It is just possible that this boy had developed some immunity to the organism invading the meninges during the several weeks prior to the onset of his meningitis. Perhaps operation was at just the right time to prevent the spilling of more organisms into the spinal fluid, and the body resistance was enough to destroy those already present. If any lesson at all can be drawn from this case it is that of the importance of early mastoid operation in any case of otitis which shows symptoms of meningitis.

Discussion: *Dr. Geo. M. Coates:* Anyone who can report a cured case of streptococcic meningitis is lucky. These cases are worth reporting, if for no other reason, to encourage us to try.

Dr. Henry S. Wieder: One case of mine showed pneumococci on smear and culture from the spinal fluid. This case was given Huntoon's anti-pneumococcic serum and recovered, as was proved later by postmortem. The postmortem showed a frontal lobe abscess just beneath the surface of the brain, but the meningitis had healed.

Dr. Oram R. Kline: I had the good fortune to have a case which recovered from streptococcic meningitis, having shown 30 colonies to the plate on culture of the spinal fluid. This boy showed opisthotonos and severe headache. Treatment with transfusions and frequent spinal drainage seemed to accomplish the result. We were fortunate in having as donors the father and uncle of the boy, who both had recovered from streptococcic infections.

Dr. Henry Dintenfass: Recently we had a good result in a case at the Graduate Hospital by using the Kubie treatment, which consists of intravenous administration of hypertonic salt solution with frequent spinal puncture. Kubie reports 7 or 8 cases recovered from streptococcic meningitis. I believe it is the treatment of the future.

Dr. Walter Roberts: The prognosis in these cases should be made on the diagnosis. If diffuse leptomeningitis exists the outcome

is invariably fatal. Up to the present those cases that have gotten well have had circumscribed or serous meningitis.

Dr. K. M. Houser: I should make it clear that the spinal fluid was negative for organisms before he received the anti-streptococcic serum. I am satisfied that the special things done as treatment in this case had nothing to do with his recovery.

MEMOIR OF THE LATE DR. EDWARD GLEASON. By Dr. Philip Stout.

RADICAL EXTERNAL OPERATION IN A CASE OF SUPPURATIVE SINUSITIS. By Dr. Oram R. Kline.

A registered nurse, 26 years of age, was first examined in May, 1929, for the relief of nasal obstruction. She gave the history of having had hay fever, both spring and fall every year as long as she could remember. Asthma often had accompanied respiratory infections and hay fever. Examination revealed a turgescent nasal mucosa, watery discharge, numerous polypi and a deviated septum. Removal of polypi gave marked relief. One year later a submucous resection of the nasal septum was done, and more polypi removed. In 1930, during an acute rhinitis, she complained for the first time of severe pain over the left eye and behind the left ear. In June, 1931, this returned with greater severity and was accompanied by purulent discharge. A large window was made to facilitate drainage and aeration of the left antrum, and a partial ethmoidectomy was done. She was now very much more comfortable. Throughout pregnancy she was free from nasal and asthmatic symptoms but two days after delivery, August 4, 1932, and from this time on, she was completely incapacitated by frequent and severe asthmatic seizures. On bronchoscopy there was found a large quantity of thick mucopus in the trachea and in both bronchi. This was aspirated and she was much more comfortable. After an absence of thirteen months, progressive loss of weight, persistant cough and recurrent acute exacerbations of nasal symptoms were accompanied by frontal pain usually worse on the left side. It was decided that an eradication of the focus should be attempted. Intranasal procedures were thought ill advised for this patient, so the orbital approach was used in dealing with the ethmoid, sphenoid and frontal sinuses, according to the technique of Ferris Smith. Green mucopus was found in the ethmoids and frontals of both sides; both wounds healed promptly. She has not had any nasal treatment since May, 1933, and one week ago she gave me the

history of having been in excellent health for two years, being free from asthma, hay fever, cough and post-nasal discharge. My present feeling is that allergic study should have been insisted upon before any radical operation was done.

Discussion: *Dr. Samuel R. Skillern:* Dr. Kline has been fortunate so far in his case. If the frontal sinus is large I question whether it can be thoroughly cleaned out by approach through the floor, as in the Ferris Smith operation; I therefore wonder how long it will remain in good condition. The ethmoids can be cleaned out almost as well through the nose as by the external route, and with after treatment of silvol packs and diathermy the result is more satisfactory.

Dr. Geo. M. Coates: When pansinusitis exists I believe the external operation is the one of choice; however, I have never believed the Lynch type of operation is good for the frontal only. This is because of the inaccessibility of crevices and septa, as Dr. Skillern has pointed out.

Dr. Philip Stout: In allergic cases it is not usually advisable to operate unless there is real pus present. The local condition is often made worse.

Dr. Harry P. Schenck: Dr. Kline drew the proper conclusion in saying that the patient should have had allergic studies. Hyperplasia is still possible as long as the allergic condition persists.

Dr. Mathew S. Ersner: It occurs to me that in operating on these sinuses examination of the tissue from the sinuses might give us some help in prognosis. If the tissue is hyperplastic and contains polymorphonuclears or lymphocytes rather than eosinophiles, there is more hope for relief of the condition.

Dr. Harry P. Schenck: The old claim for bacterial allergy has been denied until a few years ago. The manifestations of allergy are only partly known. Arthur Proetz has shown what a rapid process the production of polyps and hyperplasia may be, and we must consider this something more than a response to infection. So far, bacterial allergy can not be demonstrated by skin tests.

Rhinoscleroma: A Case of Scleroma of the Larynx and Trachea Associated with Atrophic Rhinitis. By Chevalier L. Jackson.

Discussion: *Drs. Kunselman, Robt. Hunter, Philip Stout.*

Lateral Sinus Thrombophlebitis. Report of a Case with Extension of Thrombosis to Innominate Vein, with Recovery. By Dr. Edward H. Campbell.

A girl, six years of age, had for one month a loose cough with running nose. Pus discharged from the left ear for two weeks,

and a small amount from the right ear for four days. This was accompanied by steady aching pain in both ears from the onset of the discharge. On examination the patient was a thin girl, appearing sick and whimpering continually. A small amount of pus discharged from both ears, and the tympanic membranes were inflamed and swollen. There was no mastoid tenderness or swelling and no swelling of canal walls. Roentgen examination of the mastoids showed good development and numerous cells in both. In the region of the antrum and pyramid there was dense bone, but the squamous cells were quite clear. No necrosis was visible. The blood count showed 13,850 W.B.C. with 88 per cent neutrophiles and 76 per cent hemoglobin. The temperature on admission was 104° and pulse 140.

The left drum was re-incised with release of a small amount of pus. On the next day the child complained of pain in the left elbow, which was tender and hot. There was no discharge of pus from the right ear and only a small amount from the left. From the local appearance the otitis media was doing satisfactorily. On the next day there was a chill, followed by a rise in temperature to 105°. The left elbow was more tender and swollen. A blood culture showed a growth of *Streptococcus hemolyticus.* Surgical opinion was, that a metastatic abscess of the elbow was present. On Feb. 12, operation on the left elbow was performed, and much pus was evacuated from an area deep in the ante-cubital space. Culture of the pus showed *Streptococcus hemolyticus.* A small amount of mucopus was found coming from the sinuses (maxillary and ethmoid) of both sides. There was no discharge of pus from the left ear, and the drum was swollen, but not bulging, with no mastoid tenderness. On Feb. 15, the patient had two severe chills, the temperature going to 108°. The leukocyte count was 13,750. On the following day there was another chill, and the temperature went to 105°. The leukocyte count was 24,350. The child's condition was critical. On Feb. 19, another roentgen examination of the mastoids showed the left mastoid denser than at previous examination. Operation on the left mastoid was performed. Considerable cell development was found. Only a small amount of mucopus was revealed in some of the cells adjacent to the antrum. The bony plate overlying the sigmoid sinus was intact. This was removed, exposing the sinus from the knee to close to the jugular foramen. The sinus was

obviously thrombosed. The internal jugular vein was next exposed and also found whitened and firm. It was incised well below the facial vein with release of liquid pus. Culture from the sinus and jugular vein showed pure growth of *Streptococcus hemolyticus.* On Feb. 23, the left side of the neck, shoulder, chest, and left arm and forearm showed considerable swelling of edematous type. The left subclavian vein had become occluded. Another superficial collection of pus in the region of the left elbow was evacuated. For another month the course of recovery was irregular and stormy, but on April 4 she was discharged from the hospital in excellent condition.

This patient presented several features of interest. The otitis media appeared to be of only moderate severity and, from all local appearances, seemed to be subsiding satisfactorily. On account of the abdominal symptoms she was admitted to the medical service. When the soreness of the left elbow developed, it was thought that a joint abscess or osteomyelitis might be present. It seems from subsequent events that valuable time was lost, when early operation on the mastoid could probably have controlled the thrombophlebitis before it had extended into the jugular vein. It seems that the thrombophlebitis originated either in one or more of the small venules of the mastoid process which enter the sigmoid sinus; in the jugular bulb lying adjacent to the floor of the tympanic cavity; or possibly in the carotid plexus or small veins of the middle ear, which empty into the inferior petrosal sinus. The phlebitis then extended into the jugular vein or sigmoid sinus and progressed in both directions. In the question of ligating the jugular vein, my preference is to operate on the jugular vein in cases of thrombosis of the lateral sinus for the following reasons: 1. To block the main pathway into the general circulation. 2. It gives a means of determining the amount of extension of the thrombosis. 3. It offers a means of establishing double drainage of the infected veins. 4. It offers a chance of limiting the extension of the thrombosis toward the innominate.

From the fact that this patient recovered it must be concluded that the resistance of the patient was sufficient to overcome the organisms persistently entering her circulation.

Discussion: *Dr. Geo. M. Coates:* I agree with Dr. Campbell's reasons for jugular ligation, though I do not always do this. The chance of later ligation may be taken. If there are signs of sepsis in such a

case I would feel safer to have the jugular ligated before opening the lateral sinus.

Dr. Henry S. Wieder: I failed to notice whether the Tobey-Ayer test was done. It might have been useful when the x-ray did not seem helpful.

Dr. J. R. Waugh: The abdominal pain in this case may have been caused by thrombosis in some mesenteric veins.

Dr. Mathew S. Ersner: It is quite evidently possible to have thrombosis of the lateral sinus without mastoiditis. So far as ligation is concerned, we have made this rule: we first get bleeding from above, and then as long as we get bleeding below we do not ligate, but if no bleeding from below then we do ligate.

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE

January 28

A Comparative Study of the Actions of Morphine and Dilaudid (Dihydromorphinone Hydrochloride) on the Intact Small Intestine of the Dog. By Dr. Charles M. Gruber and John T. Brundage, with the occasional assistance of Anthony DeNote and Raymond Heiligman. (*Department of Pharmacology, Jefferson Medical College, Philadelphia, Penna.*)

The intestinal activity as influenced by morphine and dilaudid was studied in un-anesthetized dogs with Thiry-Vella loops of the jejunum and ileum. The balloons used in recording the activity of the gut were 30 to 70 mm. long and 20 mm. in diameter. The distending pressure was 15 cm. of water. The drugs were dissolved in Ringer's solution before each experiment and injected intravenously.

The minimal dose of dilaudid causing an increase in the general tonus of the gut was found to be 0.0002 and 0.0003 mgm. per kgm. respectively for the jejunal and ileal loops. The corresponding amounts of morphine were 0.002 and 0.003 mgm. per kgm. In small and medium doses dilaudid is ten times more active than morphine in causing an increase in general tonus. Large doses of dilaudid cause a decrease in the general tone of the jejunum and cause less increase in the general tonus of the ileum than do medium doses.

The average rate of the rhythmic contractions of the ileum in the un-anesthetized dog is 10.8 contractions per minute, and for the jejunum 13.3 per minute. The effects of morphine and dilaudid upon the rate of the rhythmical contractions are not constant, and no conclusions could be drawn.

The effects of these drugs upon the peristaltic activity of the intestine are also variable; sometimes they cause a disappearance of these movements, and at other times these drugs appear to increase the amplitude as well as the rate of the peristaltic movements.

SOME OBSERVATIONS ON THE ORIGIN AND EFFECTS OF ARTERIAL EMBOLISM. By Dr. Joseph C. Doane and Dr. Nathan Blumberg.

The tragedies of medicine are often concerned with interruptions, sudden or gradual, of the blood supply of a part. If vascular obstruction occurs suddenly the most dramatic deaths result. If, however, there is a gradual lessening of the blood supply to a viscus or to an extremity, the symptom picture thus produced may be far from typical and hence difficult of recognition. Witness the stealthy approach of arterio-sclerosis and the efficiency with which the body adapts itself to its ischemia-producing tendencies, or the discovery of a completely obstructed coronary artery at postmortem with no antecedent history of a cardiac attack.

This paper concerns itself with the more or less sudden deprivation of the blood supply of a part, due to emboli or to a more gradual thrombosis. The birthplace of most thrombotic emboli which obstruct larger vessels is the heart. In 30 per cent of mitral stenotics coming to autopsy and in 15 per cent of cardiac cases generally, clots formed antemortem are found in the cardiac chambers. Mitral stenosis with fibrillation is notorious for its tendency to form cardiac clots, but all forms of endomyocardial disease are likely to lead to cardiac thrombosis. The sudden ischemia of an extremity, produced by the lodgment of a cardiac embolus in one of its larger vessels, is to be contrasted with the slow piling up effect produced by vascular thrombosis. The bifurcation of arteries is a favorite spot for the lodgment of an embolus. At the point of division of the aorta large emboli frequently lodge, the left iliac artery being more likely to receive such a clot than the right.

Three cases were reported of embolism and thrombosis of the abdominal aorta. In the first the lodgment of a small embolus at the bifurcation of the popliteal artery resulted in a piling up thrombotic process which first affected the left limb, later reached the aorta, and finally occluded the right common iliac, the inferior mesenteric and the left renal artery.

The second patient reported was one in whom a large embolus lodged at the bifurcation of the aorta, obstructed the left common iliac, and later the right common iliac.

The last patient was one with thrombosis of the aorta, probably originating as the result of the presence of an extensive atheroma of its wall. The authors directed attention to the futility of amputation of an extremity when a generalized arteriosclerosis and atheroma exists because of the strong likelihood of a reoccurrence of the process in the normal limb.

The danger of rapid digitalization and the use of quinidine in the dislodgment of cardiac clots was also mentioned. The use of citric acid by mouth and of citrates by vein to inhibit the extension of thrombosis was discussed and, in the absence of other efficient remedies, was advised. The authors directed attention to the need for careful study of the cause of occlusion and of its location before surgery is attempted. They mentioned the use of the oscillometer, the skin temperature apparatus and the histamine test as effective methods by which the above facts can be ascertained. They concluded by urging cooperation between the surgeon and the internist in deciding upon the wisdom and site of amputation of an extremity.

Idiopathic Myocardial Degeneration of Pregnancy and the Puerperium. By Dr. Benjamin A. Gouley, Dr. Samuel Bellet and Dr. Thomas McMillan.

There is a small group of gravido-cardiac patients whose cardiac involvement is obscure in origin. The cardiac condition appears to be independent of disease of the coronary artery nor is there any definite valvular lesion of diagnostic value; the lesion is primarily in the heart muscle itself. There is a focal, often widespread loss of muscle substance, in which the sarcoplasm appears to be the target of some destructive influence.

There was seen shortly after delivery, progressive heart failure: enlargement of the heart, dyspnoea, edema, the development of a soft systolic murmur due to cardiac dilatation, and gallop rhythm. There was no praecordial pain. Electrocardiographic data ruled out the presence of infarction but indicated that the myocardium was the site of considerable damage. The decompensation responds poorly to digitalis and may last many weeks. Embolism is a common complication.

In this small series of seven patients, one was 23 years old, the others were in middle life; the young patient had gone through

one confinement, the others had raised large families, having from 5 to 11 children. Four patients died; three recovered after prolonged convalescence.

These cases at the beginning were thought to be nephritic. Laboratory findings and necropsy observations did not substantiate this diagnosis. Some of these patients did have mild hypertension during the period of observation. The heart weights ranged from 450 to 500 gms.

Studies for focal infection were all negative.

This puerperal degeneration is a focal disintegration of the myocardial sarcoplasm, involving the nuclei to a lesser extent so that they remain as a conspicuous element in the cellular collection that has replaced the myocardium. Hemorrhage into these areas is often a common finding. A moderate number of lymphocytes, phagocytes and an occasional neutrophile are present. As the lesions become older they are invaded by fibroblasts and eventually become scars.

Blood Sedimentation Rate in Diabetes Mellitus. By Dr. David W. Kramer.

A study of 510 sedimentation tests was made upon a group of 366 patients; 346, or 67.8 per cent, showed abnormal readings.

The explanation for this high percentage must be either the diabetes or the presence of infections or both.

A study of the duration of the diabetes showed that the maximum difference between the percentages in the various diabetic groups was only 5.3 per cent. These figures evidently do not permit us to attach much significance to the effect of the duration of the diabetes upon the sedimentation rate.

The possible influence of the blood sugar was also studied. There was a striking similarity between the percentages in the hyperglycemic group and in the group in which blood sugar was 180 or below: in the former there were 194 cases (67.1 per cent) who showed abnormal curves and in the latter (non-hyperglycemic group) there were 152 records (68.8 per cent) with abnormal curves. From our studies we concluded that the blood sugar *per se* had no influence upon the sedimentation rate.

The sedimentation curves were analyzed with reference to age. The younger patients showed either horizontal or slightly abnormal curves. As we approach the older groups, abnormal

sedimentation rates were found more frequently. This is most probably due to the wear and tear on the tissues and the greater liability of the aged to develop infections.

Analysis of the patients observed in this study showed a high incidence of the minor infections, particularly in the teeth, tonsils and upper respiratory tract. However, the significance of the urinary tract and gall bladder must also be kept in mind.

February 25

Tonsillitis with Meningeal Symptoms. By Dr. David Riesman.

Two cases are reported in which the symptoms of meningitis were associated with acute tonsillitis. One was in a man 45 years old, who awoke one morning with severe headache and sore throat. The headache was obstinate and did not yield to medicinal treatment. Sinus x-ray and Wassermann test were negative; blood count normal; tendon reflexes exaggerated; lumbar puncture showed increase in globulin and 1125 cells to the cubic mm. Temperature ranged from 102° to 104°; leukocytes, 16,000 per cmm. of blood. Examination showed, in addition, a definite follicular tonsillitis. The patient made a prompt and complete recovery.

The second case was that of a child four years old, who had been subject to convulsions up to the age of three. In May, 1933, the boy suddenly became feverish and had a convulsion. There was some rigidity of the neck, no Kernig sign, bilateral Babinski. The throat showed a slight degree of tonsillitis. Spinal fluid at the first tap showed 500, at the second 1000 cells per cmm., chiefly lymphocytes. Blood culture gave *Streptococcus viridans,* but the spinal fluid was free from bacteria on staining and on culture.

Reference is made to the meager literature on the subject of the relation of tonsillitis to meningitis and to the so-called acute aseptic and acute serous meningitis, which the cases here reported resemble.

The Minor Blood Agglutinins and their Possible Relation to Post-Transfusion Reactions. By Dr. William P. Belk.

The minor blood agglutinins have been little studied as a possible cause of post-transfusion reactions. A few reports in the literature show a difference of opinion on this question.

The minor blood agglutinins are the subgroups, the irregular isoagglutinins, the normal cold agglutinins and the pathological cold agglutinins. The rouleau forming property must be considered in this connection, as it has the property of causing clumping of erythrocytes and so leads to confusion. According to Landsteiner practically all bloods have the property of agglutinating their own cells at 0° C. This is due to the normal cold agglutinin. This agglutinin appears to be the same as the pathological cold agglutinin in its characteristics, except that the latter is associated with disease and is often of high titre. At any rate, those agglutinins which have the power to clump the cells of the blood from which they are derived, the cells of other bloods of the same group, and those of Group 0 blood at low temperatures, but not at high temperatures, constitute the majority of the minor agglutinins.

A technique is described for the detection of these temperature sensitive and other minor agglutinins. With this method 161 bloods from patients and 265 bloods from healthy donors were studied. It was found that 59 per cent of specimens in both series showed some power of self clumping. The stronger reactions, however, were six times more frequent in the ill than in the healthy. From this it is inferred that the cold agglutinins are increased in titre by the process of some diseases, and that in about 20 per cent of patients the titre of these is high enough to make a post-transfusion reaction probable.

Eighty-two of these patients were given 209 transfusions with 23 reactions, of which 16 (70 per cent) could be attributed to the effect of the autoagglutinins. This relation, however, was not entirely proven, as the amount of blood given was small in the patients with well marked minor incompatibilities. There was evidence that smaller amounts of blood were required to produce reactions in such patients than in those with weak autoagglutinins.

Partial evidence is thus furnished that autoagglutinins are productive of post-transfusion reactions if present in sufficiently high titre.

Changes in Pulmonary Tuberculosis Following Abdominal Compression. By Dr. Burgess Gordon.

Certain unfavorable results in the standard treatment of pulmonary tuberculosis are due to the traumatizing action of

cough and of the deep, inefficient and uncontrolled excursions of the lungs. The present study of 129 patients indicates that abdominal compression, as a means for elevating and supporting the diaphragm, gives symptomatic relief and favors expectoration. Roentgenographic evidence shows that closure of certain cavities and retrogression of lesions occur with prolonged abdominal compression. The reduced size of, or disappearance of certain cavities suggests that these "cavities" are merely dilated sacs, expanded by increased pressure from within and stretched outwardly due to deep excursions of the lungs. It appears that the elevated diaphragm serves to release the tension within the cavities and thus minimizes the tendency to dilatation and indirectly favors normal closure.

THE CLINICAL AND ROENTGENOLOGIC FEATURES OF PULMONARY METASTASIS. By Dr. John T. Farrell, Jr.

Pulmonary metastasis was carcinomatous in 61 or 78 per cent of 78 postmortem examinations, sarcomatous in 12 or 15.3 per cent, melanotic in 2 or 2.4 per cent, and followed in one case each an endothelioma, teratoma or thymic tumor. Metastasis was solely pulmonary in nine; other organs were involved in the remainder. Twenty-one of the carcinomata arose in the gastro-intestinal tract, 9 in the urinary, 8 in the generative, 7 in the respiratory, 7 in the breast, 4 in the ductless glands, and from undeterminable source in 5. None arose in the gastro-intestinal tract distal to the duodenum. Six or 85.7 per cent from the male generative tract were prostatic.

The small number of sarcomas precluded analysis.

Fifty-three patients were males, 25 females. Forty-two or 63.8 per cent were between forty and sixty years of age.

Respiratory symptoms were few, and were determined by the extent of the changes and complications. Forty-three patients or 55.1 per cent had none; 23 had dyspnea, 15 cough, 9 thoracic pain, 6 expectoration, 2 hemoptysis, and one hoarseness. The incidence of hemoptysis, pain and expectoration, compared to that of primary pulmonary neoplasm, was low.

The typical pathologic lesion is the nodule, and its shadow is the basis of roentgenographic diagnosis. Nodules are usually firm, spherical and sharply circumscribed. They vary in diameter from a millimeter to several centimeters, and are usually

multiple and bilateral, sometimes unilateral, occasionally single. They rarely break down. Bronchial occlusion and pleural complications alter the pathologic and roentgenographic appearances.

Diagnosis is practically impossible clinically; it depends on roentgenologic recognition of the nodule. Roentgenologically, metastasis must be differentiated from congestion, inflammation, pneumonoconiosis and tuberculosis.

Prognosis is grave. Forty-one or 65.3 per cent of the patients died within one year of the discovery of the primary growth.

Roentgen therapy is the only treatment of value. It frequently palliates, may prolong life, rarely cures.

March 25

Estimation of Basal Metabolic Rate from Pulse Rate and Pulse Pressure. By Dr. Bernard I. Comroe.

An attempt was made to estimate the basal metabolic rate from the pulse rate and pulse pressure in 100 patients seen in the Thyroid Clinic of the Hospital of the University of Pennsylvania. The determinations were made under basal conditions in ambulatory patients. The values obtained using several formulas were then compared. The following methods were used:

1. Read formula: B.M.R. = 0.75 (Pulse rate plus 0.74 pulse pressure) — 72.
2. Gale and Gale formula: B.M.R. = Pulse rate plus pulse pressure — 111.
3. Read-Barnett:

$$\text{Cals./sq. meter/hr.} = \frac{\text{P.R.} \times \text{P.P.}}{200} \text{ plus 27, for males.}$$

$$\text{Cals./sq. meter/hr.} = \frac{3 \times \text{P.R.} \times \text{P.P}}{700} \text{ plus 24, for females.}$$

With the three methods, it was found that there was no significant difference between the results. With the Read-Barnett formula 41 per cent of the patients showed deviation of 5 per cent or less from the observed B.M.R. (Sanborn-Benedict apparatus), while 98 per cent showed a deviation of under 25 per cent from the observed rate.

It has been concluded that the B.M.R. can not be predicted from pulse rate and pulse pressure with sufficient accuracy and consistency to render the method a substitute for measurement

by indirect calorimetry. Gale's rule can be conveniently memorized and used and gave results not significantly less accurate in our hands in 100 cases than the more elaborate calculations of Read and Barnett. If calorimetric estimation of the B.M.R. is not possible because of technical or financial difficulties, calculation of the B.M.R. from pulse pressure and pulse rate is more accurate than attempting to guess this figure from either of these observations taken separately.

Certain Effects of Decholin-Sodium upon the Kidney and Liver in Cats with Total Biliary Stasis. By Dr. A. Cantarow and Dr. H. L. Stewart.

Sodium dehydrocholate (20 per cent solution, 0.2 cc. per kg.) was injected intravenously in 24 cats with total biliary stasis of 2 to 18 days duration. The serum bilirubin concentration tended to reach a maximum about the 10th to 12th day, as in simple stasis, but the values were distinctly higher than in simple stasis. No difference was noted in the bromsulphalein retention. Nitrogen retention occurred in cats with stasis of 12 to 16 days, whereas none was observed in simple stasis.

Liver: The newly proliferated bile ducts tended to have a lumen, even at 18 days, much more consistently than in simple stasis. The ducts and periductal tissue were frequently infiltrated with plasma cells, lymphocytes and a few polymorphonuclear cells, with no evidence of a similar reaction in the parenchyma. Groups of 2 to 8 cells were degenerated and disintegrated sporadically throughout the lobule. A flattened type of apparently regenerated hepatic cell was noted about the central vein, and pale, swollen, newly regenerated hepatic cells were noted crowding the proliferated bile ducts. This finding was similar to that observed in the liver of decompression, differing from that seen in simple stasis.

Kidney: During the first few days there were marked swelling, degeneration and necrosis of the tubular epithelium, more than was observed in simple stasis. This was followed by reticulation and flattening of the epithelium of both Henle's and of the convoluted tubules, the cells and nuclei varying in size and shape; the nuclei were almost never hyperchromatic. The regenerated cells, both flat and cuboidal, at times seemed to grow in beneath the degenerated cells. The flattened cells were some-

times degenerated but contained no fat. Mitosis was extremely active, although rarely seen in simple stasis. These processes reached a maximum in 5 to 9 days.

The diuretic effect of decholin may depend upon depression of tubular function and, as in the case of mercury, an excess in dose may cause renal damage.

THE ONE-HOUR TWO-DOSE DEXTROSE TOLERANCE TEST. By Dr. Herbert T. Kelly.

Alimentary glucose tolerance tests, so universally used in the measurement of an organism's ability to metabolize carbohydrates and in the clinical study of the mechanism, are the result of diligent efforts of various workers and successful research methods. The limitations of these tests may be best portrayed by a quotation from Joslin: "Glucose and other food tolerance tests are often unreliable."

The cardinal factor involved is dependent upon the rate of absorption from the intestine of ingested glucose. The old test required 100 grams of glucose in about 200 cc. of water (40 per cent solution), administered in a single dose after an overnight fast, with four blood and urine specimens collected over a period of three hours. The new test employs 100 grams of glucose in about 650 cc. of water (15 per cent solution), divided into two equal doses each containing 50 grams of glucose, and administered thirty minutes apart after an overnight fast with a specimen of blood and urine collected at the end of a thirty and of a sixty minute period.

Both tests are based on Allen's paradoxical law of dextrose: "Limits of tolerance in non-diabetic animals are all apparent, not real. In normal individuals, the more sugar given, the more is utilized, while the reverse is true in diabetics."

The typical criteria of normal responses are: (1) a fasting blood sugar within the normal limits of the particular blood sugar method employed; (2) a rise in blood sugar which does not exceed 75 mgm. in the thirty minute sample; (3) the blood sugar in the sixty minute sample is less than equal to, or does not exceed the thirty minute sample by more than 5 mgm.; and (4) all urine samples are negative to Benedict's test.

The criteria for determining diabetes, according to the new test, are: a more or less steep rise of not less than 10 mgm. of

blood sugar in the sixty minute sample following the second dose, and the relation of blood and urine sugar values to the severity of the diabetes. This test eliminates a doubtful diagnosis of diabetes and affords an early diagnosis of latent diabetes.

Diabetic Acidosis Preceded and Followed by Spontaneous Hypoglycemia. By Dr. W. Wallace Dyer and Dr. Edward S. Dillon.

Following a brief review of the literature, a case from the Metabolic Division, Philadelphia General Hospital, was reported.

In retrospect, considering the patient's repeated hospital admissions and his history, the diagnosis of spontaneous hypoglycemia-hyperinsulism is established.

The patient's course on the Metabolic ward was outlined. On admission he showed a moderate hyperglycemia and moderately severe diabetic acidosis. Following recovery from the acidosis, the patient, after requiring as much as 70 units of insulin a day, returned to a state of spontaneous hypoglycemia-hyperinsulism. In spite of various dietary combinations his clinical shocks increased in frequency and severity. The interpretation of these was substantiated by frequent blood sugars, which ranged from 200 mg. to 5 mg. (true sugar).

The tail of the pancreas was resected, following which the patient died. Careful pathological study of operative and post-mortem material failed to reveal any significant changes in pituitary, adrenal, liver or pancreas. The immediate cause of death was pancreatitis, peritonitis and bilateral broncho-pneumonia.

The case is presented, without a physio-pathological explanation, because of its unusual features of diabetic acidosis preceded and followed by spontaneous hypoglycemia.

April 22

Report of a Case of Aplastic Acute Anaemia. By Dr. William E. Parke.

J. H., a white well nourished female, aet. 44, was admitted to the Kensington Hospital for Women with a provisional diagnosis of incomplete abortion, on account of frequent and profuse menstruation for the past three months. In addition there was

found an upstanding mass of glands in the right groin, neither painful nor reddened. She had no sore throat nor sore gums and had been taking no drugs of any kind, such as coal tar or barbiturates, and except for the lump in the groin complained of nothing. Personal history and physical examination were irrelevant. Her blood count, however, showed marked anaemia and alarming leucopenia. The first count was haemoglobin 40 per cent, reds 1,720,000, whites 1,300, polys 7, small lymphs 90, large lymphs 1, metacytes 2 per cent. During the 32 days before her death her daily white count fluctuated between 2650 and 400, the reds not changing much. Her treatment consisted principally of blood transfusions, four in number, and the hypodermatic use of leucocytic cream, 12 injections with little or no benefit.

COMMENT: *Dr. Max M. Strumia:* This is a case of severe progressive anaemia accompanied by constant severe leucopenia, and especially neutropenia. One definitely eliminates any form of leukemia. The persistent severe anaemia makes the diagnosis of typical agranulocytosis or malignant neutropenia rather unlikely. Cases of acute aplasia of the bone marrow, at least functional, have been reported in the literature from time to time. They are invariably fatal. The greatest handicap to complete understanding of this case is the lack of postmortem study. However, if a name should be given to this condition I would not hesitate in calling it a case of aplastic acute anaemia.

A discussion of this condition along with the presentation of 13 new cases was published by Thompson, Richter and Edsall in the *American Journal of Medical Sciences,* CLXXXVII, 77 (1934).

MEDULLARY TUMOR OF THE SUPRARENALS, ASSOCIATED WITH HYPERTENSION AND JUVENILE ARTERIOSCLEROSIS. By Dr. D. N. Kremer and Robert W. Mathews.

Such tumors occur uncommonly and merit report. The somewhat conflicting literature regarding the association of such tumors with hypertension was reviewed. Paragangliomata are benign tumors, rarely malignant. These tumors are known as chromaffin cell tumors because they take the chromaffin stain. It has been noted that in paraganglioma of the adrenals there occur vasomotor instability and paroxysmal hypertension.

The following is a report of malignant hypertension in a girl,

14 years old, who on previous hospitalization was diagnosed as having a mixed nephritis. On autopsy there was discovered a bilateral tumor of the medulla of the adrenals. Left adrenal weighed seventy grams; right, thirty-five grams. Histologic examination showed a chromaffin cell tumor. In addition, the aorta showed juvenile atherosclerosis; heart was markedly enlarged; and examination of the brain disclosed a left cerebral thrombosis.

In commenting on the above case, the part played by the medullary growth in the causation of the hypertension was discussed. The clinical history of such a case may be divided into two distinct phases. 1. Crises of paroxysmal hypertension, with intervals in which the pressure is normal. 2. Pressure crises increasing in frequency, with hypertension becoming permanent and with associated renal and vascular changes.

Summarizing the report, the possibility of a primary hemorrhagic nephritis merging into a malignant phase was not considered because of normal urinary findings, variable specific gravity and negative blood studies. Some disturbances in distribution of hair and fat suggested some pituitary factor possibly influenced by the adrenal hormone. The early clinical history of the case suggested hypertensive crises. Later, the persistent hypertonia, arteriosclerosis and enlargement of the heart indicated permanent organic changes.

The conclusion was reached that the hypertension was due to an unrecognized adrenal factor with symptoms of a paroxysmal type of vascular crises; later, the development of a fixed hypertension with the organic changes occurring in the malignant type.

Aneurysm of the Thoracic Aorta: Report of a Case with Surgical Intervention. By Dr. Russell S. Boles and Dr. Moses Behrend.

J. M., male, colored, aged 48, was admitted to the Medical Service of Dr. Boles, October 10, 1932.

His chief complaint was increasing weakness, dyspnea, and swelling over the "breast bone." Twenty-six years previously he had noticed a sore on penis. This was treated by circumcision.

Patient presented a mass over the sternum between 3rd and 4th ribs, 13 cm. in diameter at its base and protruding about 6 cm.; systolic and diastolic murmur; capillary and Corrigan pulse.

A sanguineous purulent material exuded from the mass. There was no evidence of decompensation.

X-ray showed heart not enlarged. Aortic arch exhibited upward tilting. A dense shadow was seen just above the diaphragm with definite erosion of the sternum.

Cardiograph showed many extrasystoles.

Dr. Jump in consultation wired the aneurysm October 31, 1932. When the trocar was passed a sero-sanguineous pus exuded. Culture showed *Streptococcus viridans.*

After consultation with one of us it was decided to do a formal operation. This was performed January 12, 1933. Skin was divided over the tumor after which there was a spectacular surge of blood, which was controlled by a finger and hand. The line of incision was sutured with two rows of cat-gut sutures. There was no leakage and recovery was uneventful.

The patient was referred back to service of Dr. Boles.

He lived for ten months following operation. Death was due to external rupture of the aneurysm.

Postmortem: ruptured saccular aneurysm, involving the right sinus of Valsalva was found. Heart showed marked coronary arterial sclerosis, chronic adhesive pericarditis, chronic calcified aortic valvulitis. The aorta was the site of syphilitic aortitis and sclerosis.

Cases of thoracic aneurysm are rarely operated upon. Those found in the literature that have been operated on lived only a few hours following surgical intervention. This patient lived ten months following operation. The reason for operation was the uncertainty of the diagnosis. The patient was temporarily benefited by the operation, due to the increase in size and organization of the thrombus.

Bleeding Peptic Ulcer: An Analysis of 100 Cases. By Dr. James Hervi Sterner and Dr. Edward L. Bortz.

An analysis of 101 cases of duodenal and gastric ulcer with massive hemorrhage was presented. Criteria of diagnosis were given. Tables showing data on hemorrhage and other symptoms were discussed, with the following summary:

1. Of those cases of duodenal or gastric ulcer with massive hemorrhage, the hemorrhage was an initial symptom in about 1 in 5 cases.

2. The type of hemorrhage—hematemesis or melena—is of no value in helping locate the site of the lesion.

3. 1 out of 3 cases operated for bleeding peptic ulcer had subsequent hemorrhage, in an average interval of 6 years after operation.

4. In duodenal ulcer with hemorrhage the chances of subsequent hemorrhage in an operated group were about 6 times as great for those with 2 or more previous hemorrhages as in those with only 1 hemorrhage previously.

5. In a group of 44 cases of duodenal ulcer with hemorrhage, of 39 operated and followed an average of 3⅓ years, 1 in 4 had recurrence of hemorrhage, 1 in 3 recurrence of pain or distress, and 3 in 5 recurrence of symptoms.

6. In the group of gastric ulcer with hemorrhage, 11 cases, all operated, followed an average of 2¾ years, 1 in 4 had recurrence of hemorrhage, 1 in 2 recurrence of pain or distress, 3 in 4 recurrence of symptoms.

7. 11 cases died, a mortality of 11 per cent. Five died of continued hemorrhage, 6 of post-operative complications.

May 27

The Prognostic and Pathogenetic Significance of the Distribution of Pulmonary Tuberculous Lesions. By Dr. F. Maurice McPhedran.

The differentiation of tuberculous and non-tuberculous lesions of the lung was discussed, with slides of films and diagrams. It has long been indicated in physical examination, and more recently has been shown in X-ray films, that non-tuberculous bronchopneumonias * originate in the cardio-phrenic angle (area 5) and spread along the diaphragm (areas 5 and 6). Tuberculous lesions originate and have their maximum density in this region only in the first six months of life.

An analysis has been made of a series of 50 clinic cases, including white and colored patients of both sexes and various ages, that have gone from positive sputum to negative sputum with little or no treatment. It is shown that this spontaneous retrogression has been associated with lesions of considerable extent, originating in the site characteristic for non-tuberculous broncho-

* Riesman, D.: *J. A. M. A.*, 1934, *102*, 673. McPhedran, F. M.: *Am. Rev. Tuberc.*, 1927, *16*, 420; 1929, *20*, 532; *J. Clinical Investigation.*

pneumonias. In cases of steadily progressive tuberculosis only transient or small lesions or none have been seen in this region, except in terminal stages.

Slides are shown of cases in which fluctuations of non-tuberculous basal lesions, in association with tuberculous lesions in the upper two-thirds of the lung, have been studied in closely spaced serial views taken from various angles. In these cases marked retrogression of apical and childhood-type lesions has been observed with and shortly after severe exacerbations of basal lesions. In some young adults the apical lesion has again become progressive after the associated basal lesion has ceased to fluctuate or has disappeared or healed. In cases of uncomplicated tuberculosis without treatment a much more steady, often uninterrupted, advance has been followed in serial observations.

Recovery from Subacute Bacterial Endocarditis; Presentation of a Case. By Dr. Anna P. Klemmer and Dr. Roland N. Klemmer (Lancaster, Pa.).

We have reported recovery from a severe case of subacute bacterial endocarditis in a woman, who had suffered three attacks of rheumatic fever in childhood and showed evidence of mitral insufficiency. There was an insidious onset over a period of 6 to 8 weeks, with finally considerable abdominal pain, pronounced psychic disturbance, pulse to 140, septic temperature rising to 105° F., severe substernal pain, petechiae, four blood cultures positive for *Streptococcus viridans,* microscopic blood in the urine and embolic hemiplegia. There is suggestive but not positive evidence that the portal of entry was by way of an infected cap from a vaginal douche nozzle. After a fever of four months duration the patient recovered from the infection, though she is still slightly limited by the previously damaged mitral valve and the residuals of the hemiplegia. She has remained well for nearly 5 years. We are uncertain whether or not the numerous injections of sodium cacodylate were of benefit.

We have briefly summarized the literature on recovery from both the mild and severe forms of subacute bacterial endocarditis. Some of the many remedies which have been used were mentioned. It is still apparent that the specific cure has not been found.

Coarctation of the Aorta. By Dr. Reynold S. Griffith and Dr. R. Manges Smith.

Seven cases of coarctation of the aorta (adult type) were observed at the Jefferson Hospital during the past five years. Six of them were adults; one an infant. Four were recognized during life and three of these are still living.

The symptoms were those associated with hypertension and vascular surcharge in the upper half of the body. Two of the patients complained of nocturia since childhood.

The diagnosis depended on the presence of collateral circulation, as evidenced by prominent pulsations and murmurs in the neck, in the intrascapular area and over the intercostal spaces. Normal or high blood pressure was present in the arms; it was much lower or entirely absent in the legs.

The roentgen appearance of the chest was characteristic in three of the cases. There were bilateral sulcations of the inferior margins of the posterior portions of the ribs. The aortic knob was absent or inconspicuous. There was enlargement of the cardiac silhouette. The aortic shadow appeared narrowed in the left oblique view.

In one case, the barium-filled esophagus was studied. The normal aortic depression in the esophagus was altered. This concavity was shorter and deeper than usual.

No x-ray study was made in two of the undiagnosed cases. A congenital heart lesion was reported in the infant. Another case, diagnosed clinically, was unrecognized roentgenographically because of the atypical appearance: the aortic knob was prominent; rib sulcations were absent. Stenosis of the aortic arch was found to be slight at autopsy.

The causes of death were ruptured aorta, cerebral embolism, broncho-pneumonia, and carcinoma of the uterus. The infant had received x-ray treatment for an enlarged thymus prior to death. At autopsy the thymus appeared normal.

Postmortem examinations were made in four cases. All of these cases showed the adult type of coarctation of the aorta. The degree of stenosis varied from slight to complete. The collateral circulation was well established in all four cases.

SERIAL VITAL CAPACITY DETERMINATIONS: A METHOD OF INCREASING THE DIAGNOSTIC VALUE OF THIS TEST. By Dr. John H. Arnett.

There are certain analogies between weight and vital capacity. In the first place, both are easily determined in the office with relatively inexpensive equipment. Secondly, like the weight, the observed vital capacity may be compared with a standard to see whether it is above or below the average for age, height, sex, et cetera. Finally, determinations may be made at intervals to see whether a gain or loss has occurred. One would expect that, as in the case of weight, the latter use of the vital capacity would prove the most helpful. Thus far, however, very little has been written upon this phase of the subject, most of the studies up to the present having had to do with vital capacity standards rather than with serial determinations.

In a group of 482 normal youthful subjects it was found that judged by the standard deviation, the subject's vital capacity in the preceding year offered a decidedly better means of predicting the present vital capacity than did the widely used standard of West, based upon surface area.

A group of 50 youthful subjects, whose vital capacities were determined in health and again during mild acute bronchitis, exhibited no significant change incident to the disease, while another group of 24, whose bronchitis was severe enough to send them to bed, exhibited an average diminution of 100 cc.

Vital capacity readings obtained before, during, and after attacks of pneumonia, spontaneous pneumothorax and cardiac decompensation, exhibited striking losses incident to these states, while serial readings in bronchial asthma showed dramatic fluctuations caused by asthmatic seizures. It is believed, that this method of using the vital capacity converts the test into a more practical and useful diagnostic procedure.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY

Reported by Dr. John W. Klopp

January 10

Dr. Fenwick Beekman, of New York, read his paper on "Studies in Aneurysms by William and John Hunter"; this was illustrated with lantern slides.

Dr. Hyman Goldstein (by invitation) presented, "Some Interesting Facts on Liver Therapy in Anaemia, with Historic Notes on Anaemia." It was pointed out that liver had been used on an empiric basis for many centuries in anaemia, and its use had been dignified by scientific evidence for its action many years ago, chiefly by efforts of the Italian School. It remained for Minot and Murphy, however, to popularize its use. Dr. Alexander McAlister and Dr. R. A. Luongo (both by invitation) discussed this paper, the latter giving a few personal reminiscences concerning his contact with prominent older workers in this field in the Italian Universities.

Dr. Hugo Roessler has collected a number of lantern slides of famous medical caricatures, chiefly from the principal museums and libraries of the metropolitan centres of the world, many from our own main public library. His exhibition of these was most entertaining.

February 11

The work of Madame Curie (1867–1934) was commemorated in the first portion of this session. Dr. M. Fraser Percival pointed out that the discovery of radium was not accidental but the outcome of original research upon the phenomenon of radioactivity described by Becquerel in 1896. He gave a very interesting display of fluorescence, using various crystals and a source of monochromatic light, and discussed the relation of the fundamental principles involved with the work of the Curies.

Dr. D. K. Kabakjian, of the Department of Physics of the University of Pennsylvania, analyzed the progress of the elder

Curie's work and explained the importance of her daughter's contributions in the same field.

At the time of Madame Curie's visit to the United States, in 1929, the College of Physicians had the honor of a visit from her; and Dr. Wm. Taylor, who was then President, spoke this evening of that occasion in a delightful and informal manner.

Dr. Burton Chance briefly surveyed the history of the consideration of blindness as a sociological subject and outlined the methods of education for the blind.

He spoke of the efforts which had been made for the protection of the blind, for their instruction in useful occupations, and for their intellectual development. He told of inventions of one kind or another by which the afflicted ones might "read" the printed book—which efforts have culminated in the several systems of embossed characters, the now well known and useful "line" and "print" types.

March 11

"William Hunter of Newport; Our First Lecturer on Anatomy," was read by Dr. E. B. Krumbhaar. This has appeared in published form.

Dr. M. S. Jacobs, on the occasion of the eight hundredth anniversary of the birth of Maimonides, delivered a paper on "Maimonides' Contribution to Medicine." In connection with this he had prepared, with the assistance of Dr. McDaniel, a fine exhibition of books and incunabula for our own library and from that of Dropsie College.

Dr. Isaac Husik, of the Philosophy Department, University of Pennsylvania, and also of Dropsie College, closed the meeting with his paper on "Maimonides as a Philosopher." Maimonides' philosophic work called "The Guide of the Perplexed," was designed for those readers who, having studied the Bible and the Talmud, as well as the Aristotelian philosophy, were perplexed by reason of their apparent disagreement, especially in respect to the nature of God. Accordingly, Maimodies devotes a good part of his masterpiece to an interpretation of two anthropomorphic passages in the Pentateuch and other books of the Bible in a metaphorical sense in the interest of a doctrine of the immaterial nature of God. He also discussed many other problems of interest to the philosopher as well as to the theologian, such as the existence and attributes of God, the origin of the world, the condi-

tions of immortality, the problem of evil, providence, free will, and the reason for the ceremonial law. In so doing, he shows himself a rationalist opposed to mysticism and superstition. He attempts to harmonize revelation and reason. He exerted a very great influence on his and subsequent generations in Judaism as well as in Christian Scholasticism.

April 8

"The Vital Capacity of the Lungs; Early Observations and Instruments," a paper illustrated by interesting lantern slides of historic importance, was read by Dr. John H. Arnett.

The vital capacity of the lungs is the maximum amount of air which can be expired after the deepest possible inspiration. It is measured by means of a spirometer. Both the terms, "spirometer" and "vital capacity" were coined by Hutchinson, who published an exhaustive study on the respiratory functions in the *Medico-Chirurgical Transactions* (London, 1846). It is not generally known that fifty years before, Clayfield had made, and Sir Humphrey Davy had used a very similar instrument called a mercurial air holder and breathing machine; nor that Kentisch and Herbst had made clinical observations upon the breathing capacity before Hutchinson's time. During the ten years following Hutchinson's article, studies were made by numerous illustrious investigators, including Wenrich, Arnold and Pepper, which substantiated the observations of the older workers, proving that the vital capacity is influenced during health by many factors, especially age, sex and bodily measurements, and that it is influenced by many diseases, especially those of the lungs and heart.

Dr. E. H. Anthes, of the Bausch and Lomb Optical Company, gave an exhaustive account of the history of the development of the microscope. This was profusely illustrated by lantern slides, supplemented by an exhibition of microscopes and of models of historic importance.

May 13

The annual informal "conversational meeting" was held in the library. Dr. Sydney L. Wright, of the Franklin Institute's Museum Staff told of his plans to develop a medical section in the

Franklin Museum. In keeping with other departments, this museum will illustrate mechanical devices as applied to medicine and will house exhibits which can be operated by the public.

Dr. McDaniel spoke informally of the colophon and pointed out many examples of its various forms in the college collection of incunabula, which were examined by the audience.

Preceding and following the meeting, members had an opportunity of viewing a display of the College collection of autographs arranged by Dr. McDaniel.

PROCEEDINGS OF THE SECTION ON PUBLIC HEALTH AND INDUSTRIAL HYGIENE

June 10

Special Meeting in Honor of the American Association of Industrial Physicians and Surgeons

Volatile Solvent Hazards and How they may be Minimized. By Henry Field Smyth, M.D., Dr. P.H., Asst. Prof. Industrial Hygiene, University of Pennsylvania.

Of recent years volatile solvents as a class have been finding wider and wider fields of usefulness in industry, and new solvents are continually being introduced with little or no consideration of their potential toxicities.

The more commonly used and some of the newly introduced solvents were listed.

Use of such products in open processes or in supposedly closed but in reality leaky systems not infrequently gives rise to serious or fatal cases of poisoning and so gives a bad name to these solvents, which may usually be employed with safety if their physical and toxic properties are understood and respected.

These products with similar properties and uses were discussed as a group. The selection of the worker by pre-employment physical examinations was discussed, including the types of workers who should be excluded. The factors considered were conditions of the heart and lungs, abnormalities of the blood, skin sensitivity, nervous and mental conditions, disturbances of the digestive tract, hepatic and renal conditions.

The importance of periodic examinations, their type and frequency were discussed, as was the importance of adequate diet for the workers.

Under protective working conditions were discussed closed versus open system processes, air helmets versus respirators, exhaust ventilation, local versus general, with the factors that make exhaust ventilation adequate and how its adequacy should be determined. Safe limits of exposure were discussed and their de-

termination stressed, with the value of limiting exposure time where safety cannot be attained otherwise. The possibility of handling volatile materials in open vats with safety was considered.

The importance of adequate upkeep of all protective devices and methods was stressed, with a plea for frequent checking of the same.

A caution was given against the hasty introduction of new volatile materials in industrial processes without first determining their potential toxic properties.

If the methods outlined are employed, it should be possible to use even highly toxic volatile liquids with a reasonable degree of safety. To sum up: know your hazards, select your workers, protect your workers, check frequently on workers' health and on the efficiency of protection offered.

THE CAPACITY TO WORK. By Henry H. Kessler, M.D., Newark, N. J.

The determination of the capacity to work has become an important value in the social and economic life of today. While this judgment is important in the fields of industrial management and accident prevention, it has its widest application in the general field of social insurance. The determination of pensions and the verification of the claims of applicants for relief and compensation under all forms of protective social schemes depend on this concept. These judgments, for example, form the partial basis for the computation of damages in public accidents, while in industrial accidents they form the major basis for the determination of the compensation paid.

This determination is made, for the most part, by intuitive correlation and by so called scientific methods. Regardless of the yardstick used, whether the intuitive judgment of the physician on the basis of his previous experiences or a definite test of cardiovascular efficiency, the judgment is apt to be false. This is due to the fact that there is no direct correlation between physical defect and capacity to work. Undervaluation of the individual's capacity to work is an error committed not only by laymen but by physicians as well. This error is due to two factors: one, the ever present psychic component in all disability; and two, the safety factor.

That the body can accommodate itself to unusual demands, despite disease or congenital or acquired defects, is due to its physiological resistance based on factors of safety in its own structure. Through self repair, regeneration, hypertrophy, adaptation to new conditions, vicariousness of function, or substitution of one structure for another, such as the skin for the kidney, the body is able to combat its environment and fight off harmful influences.

Though the evaluation of work capacity is theoretically impossible, we are nevertheless faced with the task of providing a practical solution to the problem. The nearest approach to an accurate judgment of reduced working capacity is that encountered under conditions simulating a work environment. This can be carried out by utilizing a work shop similar to one associated with the New Jersey Rehabilitation Commission. This is equipped as a complete woodwork and paint shop and contains all the tools used in carpentry and cabinet-making, with the exception of automatic machinery.

A disabled person is referred to the shop and is then assigned to a kind of work consistent with the nature of his handicap. Generally the worker commences with coping, saw practice, sandpapering or rough painting. As he demonstrates his ability he is advanced to light carpentry, and finally to general carpentry. When he has consistently demonstrated his ability to undertake the heaviest operations for one month, he is referred for placement.

Observation of the individual in the work shop is a valid means of determining his capacity to work. The work processes are graded into three classes, light, moderate and heavy, and an arbitrary percentage of disability is designated for each class.

Although the curative work shop serves as a laboratory for the determination of the work capacity of the individual, the period of observation in the shop frequently results in complete recovery. Not only are the workers with marked neuroses materially benefited, but even those with definite focal injuries demonstrate a working capacity far beyond the estimates made by the examiners.

THE INTERRELATIONSHIPS OF THE GLANDS OF INTERNAL SECRETION CONCERNED WITH METABOLISM

THE MARY SCOTT NEWBOLD LECTURE XXXV *

BY C. N. H. LONG, M.D., D.Sc.

(Published in full, *Amer. J. Med. Sci.*, 1936, 191)

(*Abstract*)

THE ASPECTS of the metabolism of carbohydrate, protein and fat especially significant for this discussion concern the production and utilization of glucose and the metabolism of fatty acids. The validity of the commonly accepted view concerning the interrelationship between carbohydrate and ketone metabolism and ketogenic-antiketogenic balance was discussed.

Hormones resemble catalysts in certain respects. Hormones which have a demonstrated effect on the metabolism of glucose and fatty acid are epinephrine, thyroxin, cortin (apart from its influence on salt and water metabolism), insulin and anterior pituitary. With respect to epinephrine and thyroxin, each modifies the effects of the other. The anterior pituitary influences growth and the metabolism of protein, fat and carbohydrate and affects the activity of gonads, adrenal cortex, thyroid and of insulin.

The anterior pituitary has a demonstrable influence on pancreatic diabetes. Hypophysectomy leads in the diabetic animal to: (*a*) absence of severe ketonuria, implying that either acetone bodies are not produced in the usual large quantities or else that their complete utilization is restored; (*b*) markedly decreased urinary glucose and nitrogen, indicating that the usual formation of glucose from protein (gluconeogenesis) that occurs when the pancreas is removed is much reduced. The possibility that these effects may be mediated through other endocrine glands deserves examination. The rôle of the thyroid remains unsettled. No evi-

* Read before the College, October 2, 1935.

dence supports the participation of the adrenal medulla. The studies of Long and Lukens support the view that the adrenal cortex is the organ through which the diabetogenic effect of the anterior pituitary is mediated. The adrenal cortex may contain at least two hormones: (*a*) one that controls sodium and water metabolism, and (*b*) a hypothetical entity whose function, according to the work of these authors, is particularly concerned with the production of glucose from protein and possibly with certain aspects of the metabolism of fatty acids. Hypophysectomy and adrenalectomy each alters the response of animals to phloridzin and also, according to Gerald Evans, the rise of liver glycogen that in rats follows their subjection to low oxygen tension.

A knowledge of glandular interrelationships demands: first, acquiring exact knowledge of the physiological and biochemical changes produced in the organism by hypofunction or hyperfunction of the individual endocrine organs; secondly, that these effects be placed on a quantitative basis wherever possible. Finally, for the treatment of glandular disorders the various hormones must be obtained in a relatively pure form with a dosage accurately standardized. With the elimination of the irrational and unphysiological methods of treatment, which have discredited this branch of medicine, there will come promise for future advancement.

In the case of the anterior pituitary the concept of functional interglandular relationship is fully exemplified, but the control by the anterior pituitary is essentially a trophic one, and its hormones (with perhaps one or two exceptions) do not directly bring about any physiological alteration in the organism. Conversely, gonadectomy, thyroidectomy or adrenalectomy is followed by structural changes in the anterior pituitary. If these anatomical changes are shown to be accompanied by corresponding deviations in physiological activity, then we are confronted by the possibility that alterations in the degree of activity of any endocrine may, through affecting the anterior pituitary, bring about a generalized polyglandular derangement.

Collip has recently introduced the concept of antihormones influencing the activities of the anterior pituitary and the idea that the effectiveness of a trophic hormone is determined by the ratio of its concentration and that of the corresponding antihormone. If this principle is correct it adds to the possibility of delicately balanced changes in endocrine function.

LOOKING AT TUBERCULOSIS, CANCER, DIABETES, HEART DISEASE AND SYPHILIS FROM THE PUBLIC HEALTH POINT OF VIEW

THE JAMES M. ANDERS FUND LECTURE *

BY DR. JOHN L. RICE,

Commissioner of Health, City of New York

(*Abstract*)

IN A REVIEW of New York City's mortality statistics from 1804 to 1935 the enormous prevalence of pestilential diseases during the first half of the 19th century stands out in sharp contrast to present-day conditions. Yellow fever, cholera, typhus fever, smallpox, to say nothing of scarlet fever, diphtheria, tuberculosis and other infectious diseases, exacted a terrible toll of lives each year. Cholera infantum was the dread of all mothers with babies.

Even at the beginning of the present century the common infectious diseases were responsible for 37 per cent of all deaths; the diarrhoeal diseases accounted for 8.5 per cent. Diseases of the heart, arteries and kidneys were charged with 22 per cent of the deaths.

In contrast to this, at the present time the common infectious diseases account for only 17 per cent, the diarrhoeal diseases for less than 1 per cent; but diseases of the heart, arteries and kidneys are now responsible for over 51 per cent of all deaths.

There has thus been a very marked change in the problems confronting health officials; much more emphasis must be laid on the diseases common to later life, namely, diseases of the heart, arteries and kidneys, diabetes, and cancer. In addition to this it must be recognized that tuberculosis is still far from being wiped out, and that the prevalence of syphilis is a challenge which we must meet.

Birth control, with the resulting very marked decline in the birth rate (in New York from 36 to 13 since 1900) is largely re-

* Read before the College, November 6, 1935.

sponsible for the marked increase in the proportion of older adults in the population. Together with the success attending our efforts to control the contagious diseases of childhood, and the gratifying reduction of infant mortality, this has wrought a great change in the character of the physician's practice.

As far as tuberculosis is concerned, a study of the course of the mortality rate shows three distinct trends: the first, showing a gradual decline from 1800 to 1880; the next, a more rapid decline from 1880 to 1918; and the last, a still more accelerated decline from 1921 to date. The picture is encouraging, for it indicates that our present methods of attacking tuberculosis, by searching out sources of infection through the examination of contacts, are effective.

In dealing with the chronic diseases of the cardio-arterio-renal system we still need much more scientific information from clinicians and laboratory workers. It is well to know, however, that despite alarmist statements frequently made, the death rate of this group of diseases has not increased in any specific age group. Naturally, since our older adult population is now one-third greater than it was thirty years ago, there will be more deaths from diseases of later life. But for any particular older individual the expectation of life is now a trifle longer than it was. This, at least, is encouraging.

In diabetes the discovery of insulin has undoubtedly prolonged the life of many individuals. This disease is very prevalent, and probably has always been so, being often unrecognized formerly because of the failure to make routine urine examinations for sugar. Largely through the efforts of Bolduan, diabetes has come to be recognized as an important health problem, in which health administrators can hope to accomplish a considerable prolongation of life.

Even in cancer the most recent statistical analyses show that progress is being made, the death rate among white females already showing a significant reduction during the past twenty years. The increase in the registered death rate from cancer is due largely to the aging of the population. Besides this, improved diagnosis has played an important part. It is significant that the mortality rate from accessible cancers, such as those of the breast, uterus, skin, and buccal cavity, all of them cancers probably diagnosed just as accurately thirty years ago as now,

has not increased. The registered increase is limited to the inaccessible forms of cancer, in which the x-rays have helped so much in diagnosis.

Syphilis is now one of the major health problems on which we should focus our attack. We must drag discussions of this disease into the open. As physicians and health officers we may disregard the many intricate social and moral questions involved, dealing with syphilis as we do with the other infectious and communicable diseases. We can learn something from the plans followed in the Scandinavian countries, and we are fortunate this winter in having Dr. Rietz, the health officer of Stockholm, making a tour of this country under the auspices of the Health Section of the League of Nations.

Our problems, as you see, have changed, and while there is much to be proud of in our past achievements, much still remains to be done. Let us try to do as well as did our predecessors.

THE HISTOLOGY AND PATHOLOGY OF THE ESOPHAGUS WITH CLINICAL APPLICATIONS

The Mütter Lecture *

By HARRIS P. MOSHER, M.D., Sc.D.

(*Abstract*)

Excluding caustics, trauma, and cancer, I have never felt that we have an entirely satisfactory explanation for obstructive narrowings at the lower end of the esophagus. This lack is even more true for those at the upper end.

Narrowing at the lower end, long known as cardiospasm, has been described for years in medical literature. Tubular narrowing as a characteristic lesion of the upper end has been recognized only for the past six or seven years. We are now finding narrowing at the entrance of the esophagus to be as common as narrowing at the lower end. As we continue observations, I feel that it will be found to be even more common. The obvious result of these lesions is obstruction to swallowing, which may bring the patient to the point of actual starvation.

The main idea I have to present tonight is that the esophagus can be infected in acute and chronic systemic disease and that the infection, according to its duration and extent, results as elsewhere in the body in fibrosis in or about the esophagus. This is old-time pathology. It would have been recognized long ago had anybody been interested enough to look for it. Fibrosis following infection, in my opinion, best explains the narrowing both of the upper end of the esophagus and of the lower end. In fact, in infection we have a rational explanation for fibrosis and narrowing of any part of the esophagus. Spasm, which so long has been held to play the major part in obstruction of the lower end of the esophagus, plays but a minor rôle.

The lesser omentum, which connects the liver, the gall bladder and the lesser curvature of the stomach, surrounds the terminal

* Read before the College, December 4, 1935.

portion of the esophagus and continues upward into the thorax, encasing the esophagus at least on three sides as far as the bifurcation of the trachea. It acts as a pathway of infection to the esophagus from the organs just mentioned. The anatomical configuration of the lower end of the esophagus makes it a natural and favorite location for strictures and fibrotic narrowing.

The esophagus often shows prenatal infection, so that the stage may be set for trouble even at this early date. In a series of 68 babies the writer found 3 instances of stenosis of both the pylorus and cardia.

It has long been known that in cirrhosis of the liver, owing to interference with drainage, the esophageal veins become enlarged. Sections of the esophagus show not only enlarged blood vessels but dilated and infected gland ducts. The esophagus may also be riddled with cysts.

Superficial ulcerations of the esophageal mucous membrane are constantly in the making. Many are due to the superficial glands breaking through the surface of the epithelium. In other cases the lymphoid follicles enlarge and do the same thing. These ulcerations lie in wait for infection to become pathological ulcers. The superficial vessels of the epithelium when thrombosed may become large enough to extend to the surface and cause a break. These ulcerations are important because it takes but little to glue the vertical rugae of the esophagus together especially at the lower end and to start obstruction.

About nine years ago the writer began to examine autopsy specimens of the esophagus in order to see if it was involved in acute or chronic systemic infection. To date between 450 and 500 specimens have been examined. The results may be summarized as follows:

The esophagus is often infected in acute and chronic systemic disease. Infection in the esophagus, as elsewhere in the body, often results in fibrosis in or about the esophagus. This fibrosis, if extensive enough or rightly placed, results in obstructive narrowing. The lower end of the esophagus is especially liable to infection and fibrosis on account of its nearness to the stomach, the gall bladder and the liver,—organs often diseased. Prominent among the diseases in which infection of the esophagus has been found are arteriosclerosis, nephritis and pneumonia.

The writer prefers the name "fibrosis of the terminal portion

of the esophagus'' to the name ''cardiospasm.'' In his cases the fluoroscope has shown little if any spasm. Autopsy specimens of this condition and the diagnostic bag show the same findings, namely, a narrowing of the esophagus in the crural canal and a fibrosis of the terminal portion. The histological examination shows fibrosis of this portion of the esophagus and a disorganization of the musculature. In advanced cases a backward bend of the lower end of the esophagus and a vertical twist play an important part in keeping up the obstruction. In some cases these two factors are as important as the fibrosis. Dilatation will give a clinical cure in the majority of cases of fibrosis of the terminal portion of the esophagus. In the old and advanced cases, however, where there is a double bend of the lower end of the esophagus and when the esophageal wall is thin, it is very dangerous to manoeuver the dilating bag round ''dead man's curve'' even with the guidance of a swallowed string. These advanced cases are best dealt with by an anastomosis of the lower end of the esophagus with the fundus of the stomach. This operation has been done successfully both in England and in this country.

For the past year and a half the writer has been feeding tar to mice and guinea pigs, in order, if possible, to see the reaction of the basal cells of the esophageal mucous membrane to the prolonged ingestion of an irritant. One guinea pig, which was fed tar once a week for seven months up to the last week when it was given three daily doses and then killed, showed at the lower end of the esophagus an abscess in the esophageal muscles, both chronic and acute infection, and a breaking through of the basal cells of the epithelium into the stroma beneath. In chronic infection of the esophagus an increase in the activity of the basal cells of the epithelium and a breaking through into the stroma beneath is not uncommon.

PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY, OCTOBER TO DECEMBER, 1935

(*These proceedings will appear in abstract in the Amer. Jour. Ophthalmol. and in the Archives of Ophthalmol.*)

October 17

Dr. Alfred Cowan: "Cyst-like Ectropium Uveae."

Dr. Charles A. Rankin (by invitation): "Multilocular Cyst of the Iris."

Dr. Edmund B. Spaeth: "Dinitrophenol Poisoning with Cataract."

Dr. W. G. Mengel (by invitation): "Rapidly Developing Cataracts Following the Use of Dinitrophenol." Exhibition of Case.

Dr. Jacob B. Feldman (by invitation): "Review of Infrared Photography and its use in Ophthalmology."

November 21

Dr. F. H. Adler: "Retino-Choroiditis with a Macular Lesion Simulating Disciform Degeneration." Exhibition of Case.

"Anterior Uveitis and Periphlebitis Retinae." Exhibition of Case.

Dr. T. B. Holloway: "Blood Staining of the Cornea." Exhibition of Case.

Dr. Warren S. Reese: "An Unusual Type of Blood Staining of the Cornea." Exhibition of Case.

Discussion by: Dr. Cowan and Dr. Holloway.

Dr. Bernard Samuela of New York City (by invitation): "Histopathology of Papilledema."

Mr. Edgar B. Burchell of New York City (by invitation): "The Anatomy of the Accessory Sinuses and Their Relationship to the Orbit."

Dr. Edmund B. Spaeth: "Symblepharon from Pemphigus Corrected with Mucous Membrane Graft." Exhibition of Case.

DECEMBER 19

Dr. George E. deSchweinitz and Dr. A. G. Fewell: "Some Remarks Concerning a Pituitary Adenoma of Long Duration."

Discussion by: Dr. Fewell, Dr. Buchanan, Dr. Lillie and Dr. Zentmayer.

Dr. William Zentmayer: "Presentation of a Patient Showing the Sequelae of Interstitial Keratitis with Massive Retinal Hemorrhage."

Dr. Perce DeLong and Dr. Joseph V. Klauder: "Presentation of a Patient with Lupus Erythematosus of the Eyelids and Conjunctiva."

PROCEEDINGS OF THE SECTION ON OTOLARYNGOLOGY, OCTOBER TO DECEMBER, 1935

(*Abstracted in Archives of Otolaryngology*)

October 16

Sympathetic Ganglion Neurosis Following Sinusitis and Relieved by Acetyl-beta-methyl Choline Chloride. By Dr. William Hewson.

Greenfield Sluder has adequately described the syndrome that bears his name, calling it "lower half headache" or spheno-palatine ganglion neurosis. This case is presented because it is hoped that those who are neurologically minded may explain why the experimental measure used proved beneficial and whether it is right to suppose that this case suggests the presence of afferent fibres in the sympathetic pathways, or that acetyl-beta-methyl choline chloride (mecholyl, Merck) may affect sensory neurons.

When I first saw this patient in November, 1929, she was 34 years old. She had had headaches since 1914. The headaches were dull at first and generalized, showed a tendency to recur with every cold or sore throat and later persisted for several months at a time. They grew in intensity and became overwhelming and depressing, and were confined to the right side of her head. Paroxysms of severe shooting pains extended behind the right mastoid, in the neck, along the vessels and to the right shoulder and arm. Infection was found in the ethmoids, sphenoids and right maxillary sinuses, so these were operated on extensively intranasally, and a Caldwell-Luc operation was done on the right maxillary sinus. The operations gave promise of great relief, but the headaches returned with almost the same intensity. Two or three injections of novocaine were made into the spheno-palatine canal with some slight temporary relief. During two severe paroxysms of pain, Dr. Francis Grant injected novocaine into the region of the right upper thoracic sympathetic ganglion with almost instant relief for a short time.

The experimental use of mecholyl was tried. Small doses were

taken three or four times a day, the patient regulating the dose according to her tolerance, from April, 1933, until March, 1934. Her general improvement and relief from headache was very marked and continued until the present time. Dr. Spaeth's report about her visual fields is interesting in relation to the drug, for a very marked central scotoma seemed to be relieved soon after starting the medicine. It is supposed that there was deficiency of cholin-like substances in her tissues with possibly excessive spinal sympathetic action from some cervical lesion. Administration of mecholyl supplied this deficiency, assisted the parasympathetics, and checked the spinal sympathetic influences.

Discussion: *Dr. Edmund B. Spaeth:* This patient was first seen by me, March 8, 1929, and was a case for simple refraction. She was having headaches. Her fundi were negative. She showed no defects in either central or peripheral fields of vision. On June 23, 1931, she showed defects in her central fields, suggestive of glaucomatous changes. Eight months later there was a tiny bitemporal flattening of the peripheral fields in both eyes. On December 27, 1932, these blind spots had increased most decidedly on the right, and on the left she had a typical Bjerrum scotoma, a scotoma very suggestive of glaucoma. A group of central fields from December 27, 1932, to June 2, 1933, show in the order of their date the rise of this scotoma and its recession. Her fields are now normal. The interpretation of these fields of vision is of interest. I consider them the result of angiospasm, actually an angioscotoma, so that the entire inferior group of vessels leaving the papilla were involved to such a degree that with the fine test objects used the field corresponds to that superior nasal quadrant which was wiped out. The patient has been comfortable now without field changes for over a year.

Dr. Edward H. Campbell: I made two or three injections of the sphenopalatine canal in this patient with novocaine as a test before alcohol was used. No beneficial results were obtained so alcohol was not used. Many of these lower half headaches are not of the spheno-palatine type, so do not yield to the injection treatment.

Dr. George M. Coates: If mecholyl will do for others what it has done for this patient it is worth while.

Dr. Robert A. Groff: The subject of atypical neuralgia is still an open one. Sluder's syndrome may be anything which causes pain in the nose, eye, back of neck and shoulder. We, as surgeons, question whether the first and second thoracic ganglia may be the site of origin of pain sensations or whether pain sensations are coming through but not originating in the ganglia. Paravertebral injection has proved beneficial. First novocaine is used, and if this works, alcohol is used later.

Case Report on Nasal Ionization. By Dr. Philip S. Stout.

Ionization of the mucous membrane of the nasal chambers for various conditions is not new. It was tried at least thirty or forty years ago. More recently, during the last seven or eight years, there has been quite a revival of this process in certain sections of this country and Europe. Several methods have been suggested; one, packing the nose with packing saturated in zinc solution or solutions containing zinc, cadmium and tin, placing an electrode of the same material into this packing and using positive galvanic current. Another method is to use the solution directly in the nostrils; special glass apparatus for this has been devised. Still other methods have been suggested. Ionization is used in allergic nasal manifestations and chronic sinusitis. Four cases selected from several dozens are presented as typical of the results obtained. From the cases handled so far it would seem that from two-thirds to three-fourths of them would be benefited by this treatment. Treatment should be used on selected cases only. Some severe reactions may follow the treatment.

Discussion: *Dr. Alexander Clark* and *Dr. Benjamin D. Parrish.*

An Unusual Case of Carcinoma of the Tonsil. By Dr. George B. Wood.

The patient, a married man, 58 years of age, was first seen by me in 1924, at which time he had a simple mastoid operation done. My first examination showed a marked swelling in the left upper part of the palate, which was evidently due to an encapsulated growth rather firmly attached to the hard palate. The mucous membrane over it was freely movable. A biopsy was obtained, and the majority of those who saw the specimen believed the growth probably a teratoma. He was treated with x-ray. The growth remained quiescent until about two months before his admission to the Graduate Hospital on April 9, 1935.

During these two months the growth had so increased in size as to push the tonsil across the throat. A biopsy was taken from the inside of the growth. This was reported as carcinoma of a rather malignant type. An attempt was then made to remove the mass from his throat, but the mass was found to be so firmly attached that exposure in the palate was not possible. A tonsil snare was then placed around as much of the growth as could

be picked up, and a portion, approximately the size of a hen's egg, was removed. He was then subjected to heavy x-ray therapy. A massive slough formed in the palate on the side of the growth, with the final mass coming out approximately five weeks after his operation. It left a clean unabraided mucous membrane with no sign of any tumor. The local condition is now very satisfactory. The crater-like opening has apparently entirely filled.

Discussion: *Dr. Warren B. Davis.*

Extensive Osteomyelitis with Brain Abscess Complicating Frontal Sinusitis. By Dr. Samuel R. Skillern, Jr.

A girl, aged 13, stated she was well until October, 1933; following a severe head cold, she had dull pains over the right eye with a heavy white discharge from her nose. This was followed by sudden swelling of the right upper eyelid, which progressed to point and rupture at approximately the center of the upper lid. On January 21, 1934, when seen in the hospital, she appeared anemic, emaciated and was so weak that she required assistance in walking. Brownish pus was seen escaping from a fistulous opening about the center of a greatly swollen, right upper eyelid. The forehead showed a boggy, edematous swelling extending from the superciliary ridge upward approximately three centimeters. Former x-rays revealed massive pathology in the frontal sinus. The pre-operative x-ray showed the left frontal clouded and the right clouded with the sinus outline quite indistinct. The ethmoids showed marked clouding of all the cells on the left and considerable clouding of most of the cells on the right. The maxillaries showed clouding on the left and moderate clouding on the right. Neurological examination showed signs of meningeal involvement with some chronic meningeal changes.

At operation, a fistula was found one centimeter above the right superciliary ridge. After removal of the anterior wall of the right frontal sinus it was noted that the posterior wall of the sinus had completely melted away under the osteomyelitic process. The left frontal sinus was filled with necrotic loosened membrane and pus. The skull was removed upward and outward to beyond the limits of the edematous swelling over the forehead. A hollow sound was then gently inserted into a brain abscess, rupturing the capsule. This was followed by a gush of foul-smelling brownish pus.

On February 6, 1934, the greatly improved physical condition of the patient warranted the completion of the operation. Removal of bony sequestra and ethmoidectomy and maxillary antrotomy were done. On March 9, plastic closure of the wound was undertaken. By March 23, the wound had healed with a broad scar across the forehead. As medical history shows recurrence of brain abscesses after lengthy periods of apparent well being, we shall continue to watch this child for any future development.

Discussion: *Dr. George M. Coates: À propos* of Dr. Skillern's last picture of this case, she is very much better and stands well in school. She will eventually have re-formation of her skull, we believe.

Dr. Samuel R. Skillern: The report from examination of bone removed at operation showed osteomyelitis, and chips from the last 3 mm. were clear. At the second operation bone chips collected showed healthy bone.

November 20

The Surgical Treatment of Ménière's Disease. By Dr. Walter E. Dandy.

A study of a series of 120 cases of Ménière's disease was reported, of these 116 were unilateral and 4 bilateral. In the unilateral form the dizzy attacks can be permanently abolished by either a total section of the auditory nerve, or preferably section of only the vestibular branch on the affected side. This accomplishes exactly the same result as total section and does not in any way affect the hearing; no loss of function follows this division. Section of the vestibular branch alone has been done in two-thirds of the cases. When both vestibular nerves are divided the bilateral form is also permanently cured, but there is a little disturbance in focusing the eye when patient is moving; when at rest this is not present. There are no disturbances of gait that are visible to the observer; patient, however, feels that he can not walk as well in the dark.

The treatment for Ménière's disease is essentially the same as the treatment for trigeminal neuralgia, for which a permanent cure is effected by dividing the sensory root of this nerve.

The cause of Ménière's disease is doubtless in the nerve itself and not in the vestibular canal; certainly it is not in the middle ear. There is no relationship between middle ear disease, sinus

disease and focal infection, and the causation of this disease; it comes in healthy people and without obvious cause. There has been no death in the entire series of cases. Without operation, there is almost no chance of spontaneous cure, although the intensity and frequency of the attacks vary from time to time.

Discussion: *Dr. Francis C. Grant:* I have had the privilege of seeing Dr. Dandy do his hemisection and total section operations and I personally have done five cases. I believe Dr. Dandy's statements about the operations are correct. None of my cases were done since he has advocated the hemisection of the nerve. On the other hand, in true Ménière's disease there is always loss of hearing so total section of the nerve does not make so much more loss. I believe his operative picture is painted a little too rosily, for those with less experience in the posterior fossa than he find it not as easy as it sounds. However, it is not one of the most difficult of operations in neuro-surgery. Dr. Dandy has put this treatment on the map, for he is the first man to cut the eighth nerve for a specific condition, and by his refinements in the operation it is now possible to establish a cure of this disease.

Dr. Karl Houser: We see so many cases of vertigo which might be classed as pseudo-Ménière's disease and vertigo due to such a large variety of causes that many of us would scrap the term Ménière's disease and call it aural vertigo except for Dr. Dandy's definite description of this condition. In December, 1934, I saw a woman, 38 years old, who suffered with nausea and vomiting so severely as to incapacitate her. She had moderate loss of hearing in the left ear, chronic empyema of the left antrum and aural sepsis. Curing of these latter conditions relieved the vertigo for the past eleven months. In another case, the symptoms of Ménière's disease were all present except that the loss of hearing was not profound. Sinus x-rays in this case showed a large diseased sphenoid; when this was opened and cleared of polyps the symptoms were entirely relieved. In defense of Dr. Fürstenburg's treatment, a woman patient of mine was put on the diet and medication recommended with the avoidance of sodium chloride and substitution of ammonium chloride. She was relieved, but the symptoms returned lately, probably due to her not adhering to the regime. Another girl of nineteen was relieved after removal of infected tonsils except for some deafness which was benefited.

Dr. David J. Goodfriend: As a dentist, my interest in this subject is the relationship of the mandibular joint to ear conditions. In two cases diagnosed by Dr. Stengel's Clinic, the regulation of the bite had very beneficial effects. In the first case, the bite was close and was corrected in six months by three sets of dentures. During these six months he had two attacks of severe vertigo. In the past four years since completion of his bite adjustment he has not had any attacks and has been able to get employment. The other case was a sheet metal worker, said by the Ear Clinic to be incurable. His bite was adjusted

and several teeth were removed. He had three attacks before tooth removal and none since, and his hearing has gradually improved.

Dr. Benjamin H. Shuster: The very positive assertions made by Dr. Dandy on the subject of Ménière's disease, coming from a man of his standing and authority, are disturbing. They are disturbing to those of us whose experience and conceptions on the subject are at variance with what he says. An emphatic statement that Ménière's syndrome is never due to focal infection certainly leaves one wondering why a number of the cases in our own experience and in that of our colleague's got well under the treatment of removal of foci of infection. The total number of cases I am sure must exceed that of Dr. Dandy's large series. Dr. Houser's case reported tonight is but one instance of severe symptoms of vertigo, etc., relieved almost at once by removing a toxic factor, in this instance irrigation of an infected antrum. It is true many cases are not so easily relieved and a more complete search for the etiologic factor is necessary. However, the severe measure in the form of the surgery suggested by Dr. Dandy is not a pleasant situation to look forward to.

Dr. Dandy speaks of the operation as a rather simple procedure, but it certainly does not impress me as being so easy. The operation entails a suboccipital craniotomy, tapping of the cisterna magna, pushing the cerebellum aside and then picking the proper portion of the eighth cranial nerve to sever from several cranial nerves in that locality. One can not help feeling that even in skilled hands there is much risk in surgery. Dr. Grant, who is a fearless neuro-surgeon, hesitates tonight to agree that the procedure is a very simple one.

That the procedure does not strike at the etiology of the disease must be apparent to any one and can not be held as the solution to the problem. The statement that the disease is presumably in the eighth nerve can hardly be agreed with. It is inconceivable that such should be the case. Deaf-mutes who owe their misfortune to a meningitis certainly do not complain of Ménière's syndrome, and the pathology in them is probably adhesions about the eighth nerve following a plastic exudate.

The cause of the symptoms is not in the brain stem, as severing the eighth nerve does relieve symptoms. The only way relief is obtained is by disconnecting the internal ear in which the cause of the symptoms is certainly situated. The cause which acts on the labyrinth may not be easily located, but it certainly does not appeal as logical to locate it in the eighth nerve.

That the operation destroys a perfectly good and functioning organ is evident from the post-operative reaction these patients manifest for a week or two. This is similar to the reaction after a destructive lesion in the labyrinth, as in unilateral suppurative labyrinthitis or when the eighth nerve is severed in experimental animals.

This operation can not be looked upon as a harmless procedure even when successfully accomplished. The patients do manifest a disturbance of equilibrium and vision after the operation, as Dr. Dandy describes. This is particularly manifest when they ride in automobiles and street

ears or do unusual movements. This is quite in keeping with animal experimentation when the labyrinths are destroyed. Such animals apparently get along fairly well until they are called upon to execute more complicated acts, as running or rapidly turning around, etc. Then they lose their equilibrium.

One might look upon the operation as a desperate measure to be utilized when all patience has been exhausted and all hope abandoned for the relief of severe symptoms. Even then I would seek some simpler measure of destroying the labyrinth than the one by the craniotomy route.

Dr. James A. Babbitt, Dr. Matthew S. Ersner and Dr. Walter Cariss.

Dr. Dandy: When all is said and done, Dr. Shuster and I are really in agreement. I do not believe Dr. Shuster would agree with the treatment by formalin injection of the semicircular canals any more than I. Spinal puncture and other measures would of course be tried before operation is resorted to. The difficulty with evaluating treatment is the succession of ups and downs in this condition, and it greatly depends upon the phase at which you come in with your line of treatment whether benefit seems to follow. I have no faith in the Fürstenburg treatment but would try it before submitting to operation. I have not seen any case following trauma. In regard to focal infection, as in trifacial neuralgia it seems to occur in the earlier brackets of life when infection is more prevalent.

December 18

Memoir of Dr. J. Clarence Keeler. By Dr. Warren B. Davis. (Not abstracted.)

Case Report: Osteomyelitis of the Skull; Wide Surgical Resection with Rapid Regeneration. By Dr. M. Valentine Miller.

This case is of particular interest because of the rapid regeneration of bone, closing the cranial defect after widespread removal. The patient was a school girl, 12 years of age, who was brought to me on September 15, 1933, complaining of a head cold and left frontal sinus headache. Examination revealed involvement of her frontal and maxillary sinuses on the left side and ethmoids on both sides. Conservative treatment and maxillary washings were followed by some relief, although on September 21, 22 and 27 she had chills, and the right frontal sinus became involved. On October 6, fluctuation was noted in the scalp, and an incision was made over the swelling above the hair line. Much pus was evacuated. Other areas occurred later and were similarly dealt with. On the 18th, the x-rays showed a definite osteo-

myelitis, and on the 21st less bony destruction in the frontal bone and probable absorption of the sequestrum, also a new area of osteomyelitis.

On January 9, at operation the left frontal bone was exposed. The bony involvement was far more serious and extensive than the x-ray plates suggested. Several extradural abscesses, exudate and considerable granulation tissue were found scattered over the dura. The left frontal sinus was opened from above and found to be entirely normal in appearance. By the time the operation was completed most of both frontal bones had been removed. X-rays on March 23 showed a progression of the bony involvement, and on March 29 she was again operated on to remove sequestra from the right and left fronto-temporal regions. X-rays taken April 16, 1934, showed small isolated areas of opacity scattered over the area from which the bone had been removed. This was the first evidence of regeneration of bone.

By September 25, 1935, these areas had coalesced, forming an almost complete bony closure of the defect.

Discussion: *Dr. George M. Coates:* I saw this case early in its development and thought surgery should be undertaken but was temporarily swayed by other surgical opinions for delay. I used to think that only a few of these cases developed spontaneously and that most occurred after surgery. I believe now that most are spontaneous and that in those which are opened it is often a question as to where the process began.

Dr. Ralph Butler: My cases have been less extensive than this one, and I believe it is usually only necessary to take off the diseased tissue.

Dr. Robert Hunter: I have had only one extensive case, such as this, which preceded a cleaning out of the frontal sinus. Incision in this case extended almost to the base of the occiput. When the external table was removed, all that was left of the inner table was a red granulating surface. This patient healed so rapidly that I thought the granulations were responsible.

Dr. Oram Kline: I have had two cases of osteomyelitis with frontal sinusitis. The sinuses were treated conservatively and diseased bone removed as it became involved. Both cases had staphylococcus aureus recovered from the wounds, blood and from other bones: femur and scapula respectively. Both were operated on within a week after symptoms of osteomyelitis began, and both recovered.

Dr. George M. Coates: The last case I saw of frontal osteomyelitis was in November last. This followed surgery in the nose. I advised radical surgical removal. This was refused and the patient died of meningitis within a month.

Dr. M. Valentine Miller: Dr. Francis Grant did the surgery in this case and worked from the diseased areas to the heathy bone. This was necessary because greater extension of the process was found than had been anticipated.

Motion Picture Demonstration of the Movements of the Larynx. By Dr. George M. Coates. (Not abstracted.)

The Importance of the Blood Count in Acute Mastoid Infections. By Dr. Frederick Boerner (by invitation). (Not abstracted.)

Discussion: *Dr. Novak, Dr. Dintenfass and Dr. Miller.*

PROCEEDINGS OF THE SECTION ON GENERAL MEDICINE, OCTOBER TO DECEMBER, 1935

October 28

Intermittent Claudication Studied by a Graphic Method. By Dr. Lewis H. Hitzrot, Dr. Meyer Naide and Dr. Eugene M. Landis.

Previous methods of studying the fatigue reaction of the leg muscles in persons suffering with intermittent claudication have depended upon voluntary contraction of the muscles. The results have, therefore, been subject to great inconstancy due to variable cooperation of patients, their reaction to fatigue or their threshold of pain. Furthermore, since pain in the lower extremities on walking may be due to other causes than circulatory, mainly orthopedic and neurologic, a dependable objective method of detecting the presence of circulatory deficiency *per se* and of gauging progress in treatment or evaluating therapies should be of clinical value.

The procedure under consideration, by use of an apparatus designed by Dr. Landis, records the onset and degree of fatigue of the calf muscles subjected to standard periods of faradic stimulation in three grades of frequency. The involuntary extension of the foot at the ankle, on stimulation, moves a hinged board held against it by springs. The board, alternately pressed and released, moves a pen upon a moving strip of paper. As fatigue sets in the amplitude of the stroke recorded by the pen diminishes.

By averaging the height of five strokes at the beginning and end of each of eight stimulation periods, the changes in amplitude may be plotted as a graph for each patient and compared with standard normal curves. A series of normal graphic records was demonstrated. The curves produced in a normal extremity by occluding arterial inflow and the curves recorded by patients suffering with varying degrees of intermittent claudication were shown to differ markedly from the normal. The authors emphasized the contrast, in symptoms and in the composite fatigue

graphs, between the series of normal subjects and the series of patients.

Excretion of Prolan in Essential Hypertension. By Dr. Maxwell Scarf and Dr. S. Leon Israel.

Kylin, one of the foremost protagonists of the theory that essential hypertension is caused by overfunction of the pituitary gland, recently reasserted this belief after recovering greatly increased amounts of gonadotropic substance in the urine of patients with essential hypertension. In his study of 40 cases he demonstrated a remarkable parallelism between the amount of gonadotropic principle excreted in the urine and the height of the blood pressure. These findings can be criticized on the basis of observations made by other workers, who have demonstrated increased amounts of prolan in the urine of patients without hypertension, particularly around the menopause. In order to subject Kylin's work to a rigorous test an attempt was made to duplicate his findings on young patients with essential hypertension. Twelve such patients were studied, care being taken to exclude any ascertainable cause of the hypertension. Their ages ranged between 17 and 44; only 3 were over 35 years.

The precipitation method of Zondek was used in extracting prolan A from the urine of each patient.

Results: In 10 of the 12 patients no prolan A was found in the urine. The two patients in whom prolan A was found were the oldest of the group and had the highest systolic blood pressures (over 200 mm. of Hg). Our results did not confirm Kylin's work, since we feel that if anterior pituitary overfunction is the cause of essential hypertension and if this hyperfunction manifests itself in increased excretion of prolan in the urine, neither the youth of the patients nor the duration of the hypertension should alter the findings.

Low Blood Urea. By Dr. Frank E. Leivy, Dr. William G. Bernhard, and Dr. Truman G. Schnabel.

Attention was directed toward conditions where there is a *lowered* blood urea content of the blood. The authors cited the experiments of Mann et al. as proof that urea formation is limited to the liver. They also discussed the relationship of urea to the

total non-protein nitrogen, and stated the normal and pathologic causes for variation in the urea output. Stress was laid on the importance of studies of non-protein nitrogen-partition under such circumstances.

Detailed histories, laboratory data and particular aspects of three cases of low blood urea were reported. Except for a case reported by Rabinovitch, one of the cases had the lowest blood urea (3 mg.) so far reported. The second case was one of portal cirrhosis, proved by autopsy. The third case was one of malignancy of the breast with metastasis. In addition, a general analysis was made of 34 more cases found in the hospital records.

The authors feel that no definite conclusions as to the significance of low blood urea can as yet be reached. They suggest, in the meantime, the collection of data regarding the non-protein nitrogen-partition in the presence of low blood urea as a possible aid in the diagnosis of failure of liver function.

Persistent Pain in the Shoulder Region Following Myocardial Infarction. By Dr. Joseph Edeiken and Dr. Charles C. Wolferth.

Fourteen cases were presented in which more or less constant and persistent pain in the shoulder region had developed within a period of four months after acute myocardial infarction. In three cases the shoulder pain developed almost coincidentally with the acute attack; in four other cases, within a period of four weeks; and in the remaining cases, one to four months after the attack.

The pain has been described as burning, aching or wrenching. In two patients the pain was limited to the region of the left deltoid and biceps muscles respectively. In eight, the pain was limited to the left shoulder region; in three, to the right; while in three, both shoulders were affected. Although the pain is continuous, it is subject to periods of exacerbation and amelioration. There was a so-called "trigger zone" in two patients, pressure over which caused a great increase in pain.

The duration of the pain varied from seven weeks to five years. Six were relieved of the pain after periods ranging from seven weeks to twelve months.

In most patients examination of the shoulder region proved

entirely negative. Ordinary movement does not seem to aggravate the pain, but in some cases it was increased by exaggerated movements of the shoulder. There appeared to be no impairment of strength of the shoulder muscles, no atrophy, sensory changes nor disturbances of reflexes. Except for the two patients with "trigger zones," no tenderness on pressure was elicited. X-ray studies made of the shoulder and spine in seven of the severer cases failed to reveal any cause for the pain.

Local treatment to the shoulder proved ineffective. Deep x-ray therapy has been tried in several cases, but in only one did prompt relief of pain ensue.

It appears that the shoulder pain bears a closer analogy to causalgia than to any other recognized type of pain.

November 25

SYMPOSIUM ON INBORN ERRORS OF METABOLISM

Pentosuria. By Dr. F. William Sunderman.

The urine from a young Jewess on Dr. Gitting's service at the University Hospital was found to contain a reducing substance which was non-fermentable, yielded a greenish dye product when treated with Bial's reagent, and long needle-like crystals when treated with phenyl-hydrazine. The urine reduced Benedict's solution when heated to 50° C. for ten minutes. Following bromination the urine contained the same quantity of reducing substances as before bromination, indicating that the sugar was a ketose. On further investigation a purified phenylxylosazone was isolated, which gave a sharp melting point at 158.7° C. and which identified the sugar as the pentose, l-xyloketose. Three other members of the patient's family were found to be pentosurics.

Experimental Studies on Cystinuria. By James C. Andrews ph.d., and Dr. Alexander Randall.

A study has been made of the metabolism of sulfur compounds in a male cystinuric (age 14) using, as a control, a normal subject of the same age and sex. The cystine output of the cystinuric is remarkably constant and averages about 0.1 gm. cystine sulfur per day. This output is unaffected by daily feeding of sodium

bicarbonate or sodium citrate in amounts sufficient to keep the urinary pH between 7.0 and 7.5, although this alkalinity suffices to keep the cystine in solution and prevents calculus formation. Even without alkali administration the urine of a cystinuric is somewhat more alkaline than that of a normal individual on the same diet because of the deficiency in sulfate formation.

The daily cystine output of the subject is somewhat controlled by the general level of protein metabolism: higher levels are accompanied by a higher cystine output. The effect, however, is independent of the sulfur content of the diet.

In common with other cystinurics, this subject readily oxidizes to sulfate, cystine administered by mouth. This oxidation is somewhat more rapid and complete with the levo-isomer of cystine than with the racemic mixture.

dl-methionine is about 75 per cent oxidized to sulfate, while the remainder is excreted as unoxidized sulfur. However, we do not find that methionine administration causes any marked increase in cystine output. Direct determinations of methionine in urines following administration of methionine indicate that only a small proportion of the methionine which escapes oxidation to sulfate is excreted as such. The rate of oxidation and elimination of methionine sulfur by the cystinuric individual is much slower and more erratic than by the normal subject.

Hereditary Occurrence of Enlarged Parietal Foramina. By Dr. O. H. Perry Pepper and Dr. Eugene P. Pendergrass.

The parietal foramen occurs inconstantly; it is seldom larger than 2 mm. in diameter. A few dozen skulls have been recorded in the literature with parietal foramina of such size as to admit a finger. Only in a very few instances, however, has this anomaly been recognized during life. That it is of hereditary nature has been proved by its occurrence in two brothers, and in five generations of another family.

The present report concerns the anomaly in two additional families examined by X-ray during life. The anomaly was discovered by chance in a patient in the University Hospital because of duodenal ulcer. A study of his family revealed this anomaly in a number of individuals in several generations. A second family was discovered when an X-ray of the anomaly exhibited

under another diagnosis at a roentgenologic meeting was recognized by its similarity to those of our first family.

Genetic Aspects of Certain Blood System Disorders. By Dr. Thomas Fitz-Hugh, Jr.

The following list of hematologic anomalies and diseases constitutes the outline of this discussion.

1. Blood system disorders known to have a genetic basis:
   (1) hemophilia; (2) hereditary hemorrhagic telangiectasia; (3) hereditary hemorrhagic thrombasthenia; (4) hemolytic icteroanemia; (5) sickle-cell trait; (6) ovalocytosis; (7) Pelger's familial anomaly of nuclei.
2. Those believed by many investigators to have a genetic basis:
   (1) pernicious anemia; (2) idiopathic hypochromic anemia and chlorosis; (3) erythroblastosis of infancy; (4) familial polycythemia; (5) Gaucher's and Niemann-Pick's diseases.
3. Those which may also possibly have a genetic basis:

(1) leucoses (2) lymphosarcoma (3) leucosarcoma (4) Hodgkin's disease	malignancy?
(5) purpura hemorrhagica (6) agranulocytic angina (7) favism (8) familial eosinophilia	allergic constitution?

A study of the family incidence, constitutional pathology and contributing causes of these conditions justifies the following conclusions. (1) An hereditary basis may properly be considered, along with other factors, in the etiology of many of the so-called blood diseases. (2) The mere absence of family history of a given disorder is no proof of its nongenetic basis. Clinical (i.e. apparent) atavism is not uncommon even in "dominant" anomalies. True atavism is almost the rule in anomalies conditioned by recessive genes. (3) The supposition or proof of a genetic basis for a given disorder does not preclude helpful therapy, nor should it be viewed as a deterrent to further investigation of other etiologic factors.

DECEMBER 23

A COMPARISON OF THE EFFECTIVENESS OF GLUTAMIC ACID AND HYDROCHLORIC ACID AS REPLACEMENT THERAPY IN ANACIDITY, MEASURED BY FRACTIONAL GASTRIC AND HYDROGEN ION CONCENTRATION CURVES. By Dr. Harry Shay, Dr. J. Gershon-Cohen and Mr. Samuel S. Fels.

We believe that the study of the problem of anacidity, limited as it has been largely to studies with histamine and neutral red, has been subjected to rather one-sided investigation. Evidence is accumulating which indicates that achlorhydria, in its relationship to duodenal function, may have far greater significance than has been suspected. From studies carried on for the past six years, we believe that the gastric hydrochloric acid is the intrinsic agent which, upon its arrival in the duodenum, originates the production or liberation of a group of hormones that have far-reaching physiological effects; and this gives to replacement therapy a greater significance than the mere relief of vague digestive symptoms or of a gastrogenous diarrhoea. The inadequacy of the official dilute hydrochloric acid, even in massive doses, to alter gastric chemistry was illustrated by fractional gastric analyses, both by acid titration and hydrogen ion determinations. The marked superiority of glutamic acid was similarly demonstrated, as well as its advantages in administration.

In all, one hundred and four gastric studies were made on fourteen cases of achlorhydria, nine of whom had shown no response to histamine injection. The charts used for illustrations were selected from this group.

THE ELECTROCARDIOGRAM AS AN AID IN THE DIAGNOSIS AND PROGNOSIS OF CORONARY OCCLUSION. By Dr. Joseph B. Vander Veer and Dr. L. Emmitt Brown, Jr.

Changes in the electrocardiogram are nearly always present after coronary occlusion and are of great value in confirming the diagnosis in mild and atypical cases. The site of the infarction is determined by the artery occluded. By the "pattern" of the electrocardiogram the damaged area of the myocardium can in most cases be localized. The two common sites of the infarction are the anterior surface of the left ventricle near the apex and

the posterior surface of the left ventricle near the base. These usually follow occlusions in the left and right coronary arteries respectively.

In 43 cases of coronary occlusion seen at the Pennsylvania Hospital during the past three years there was a mortality of 37 percent. By the electrocardiographic studies the cases could be divided into anterior and posterior groups. In the anterior group of 20 cases there was a mortality of 60 per cent. In the posterior group of 21 cases the mortality was 19 per cent. Taking only those cases with one attack, the results were even more striking with a mortality of 61 and 6 per cent respectively. In our experience occlusion of the right coronary artery was seldom fatal in the first attack, but the same could not be said of left coronary occlusion. The direct chest lead was found to be of considerable value in the diagnosis of many of these cases. Post-mortem studies in 10 cases proved the electrocardiographic localization of the infarct correct in all. These results, with those of others, lead us to believe that by means of the electrocardiogram the site of the infarction can be localized in nearly all cases of coronary occlusion, and by this means valuable information in diagnosis and prognosis may be obtained.

Studies of Sulphur Metabolism of the Skin. By Dr. Joseph V. Klauder and Herman Brown, B.S.

The total sulphur content of the skin was determined according to the method of Frear and expressed as percentage of sulphur.

The sulphur content of the skin was determined from the following sources: (1) the skin of man from infancy to old age; (2) the skin of rabbits from birth to maturity; (3) the scales and skin of patients with various skin diseases; and (4) the skin obtained at autopsy of patients with systemic infections or disorders.

The sulphur content of skin decreases with age, both in rabbits and man. The normal percentage of sulphur of the skin of infants ranges from 0.40 to 0.50; it decreases in the first few years of life to about 0.35; at adolescence it is about 0.30 per cent; and in adults it ranges from 0.25 to 0.30 per cent.

Benign (non-hairy) and malignant melanoma of the skin was

generally high in sulphur. The sulphur content of malignant tissue from various viscera did not show uniformly a greater percentage of sulphur than that contained in the organ from which malignancy arose.

The sulphur content of the skin was low or low normal in one half of the series of patients dying of acute and chronic infections, and in the majority of patients dying of tuberculosis. In pellagra the sulphur content of the skin was low or low normal, and was uniformly low in patients with arsphenamine dermatitis.

Of twelve different skin diseases in which sulphur content of the skin was examined, there was a tendency to low sulphur value in lupus vulgaris and sarcoid of Boeck; the sulphur content was high in four of six patients with lupus erythematosus; and uniformly high in patients with psoriasis. As a rule, the skin at the site of psoriasis contained a greater percentage of sulphur than the uninvolved skin, and after disappearance of the disease the percentage of sulphur decreased approximating that of the uninvolved skin during psoriasis.

The significance of these findings is discussed with reference to: (1) the rôle that sulphydryl compounds play in cellular activity of normal and abnormal growth, (2) the rôle that sulphur plays in the defensive mechanism against infections and intoxications, and (3) evidence of altered metabolism of sulphur in psoriasis.

PROCEEDINGS OF THE SECTION ON MEDICAL HISTORY, OCTOBER TO DECEMBER, 1935

Reported by Dr. John W. Klopp

October 14

Dr. Roberty Ivy read a paper on "Hospitals of Paris, Ancient and Modern." This was prepared from material in a contemporary French magazine, and was illuminated by personal experiences of the author. It was illustrated by lantern slides.

Dr. Pan S. Codellas, of San Francisco, (by invitation) presented a very exhaustive account of Alexandrian Medicine, with many lantern illustrations.

An account of ancient Greek athletics was given by Dr. Burgess Gordon.

November 11

Many fine pictures of early Philadelphia hospitals, their records, etc., were shown by Dr. Robert Hunter in his delightful lecture on "The Early History of Blockley."

Dr. Conway Zirkle, Professor of Botany at the University of Pennsylvania, presented (by invitation) a paper on "The Early History of Our Knowledge of Germ Cells." This was illustrated by a collection of slides and of books from the College Library, the latter prepared through the cooperation of Mr. McDaniel, Librarian of the College.

December 9

Dr. Wilmer Krusen lectured on "The Doctor in Literature." An informal discussion, led by Dr. Burr, followed.

William Penn's Dispensatory, a book containing pharmaceutical formulae and authorized by William Penn, as evidenced by his autograph, was exhibited by Dr. Ivor Griffith (by invitation).

PROCEEDINGS OF THE SECTION ON PUBLIC HEALTH AND INDUSTRIAL MEDICINE

November 8, 1935

The Army Medical Officer and Public Health. By Brigadier General M. A. Delaney, U. S. Army (Carlisle Barracks, Pa.).

(Abstract.)

The Army Medical Corps was founded in 1775, at the beginning of the Revolutionary War.

An important service in recent times was the organization of the vaccination of our troops against typhoid fever. This was carried out following the recommendations of a Board of the Medical Reserve Corps established by Surgeon General O'Reilly, including in its personnel Surgeon General O'Reilly, Victor C. Vaughan, William T. Councilman, John H. Musser, Alexander Lambert, Simon Flexner and General Russell.

Personal reminiscences were given of an outbreak of yellow fever at Old Point Comfort with shotgun and barbed wire quarantine; of Walter Reed and of Surgeon General Gorgas. The outstanding contributions of Gorgas were reviewed: his clearing Havana of yellow fever; the control of malaria in the Canal Zone; his visit to South Africa to make recommendations for the control of pneumonia in the mines; his visits to Peru and to Africa combatting yellow fever. In London he was made by King George a Knight of the Royal Order, and in London he died.

During the Civil War, Surgeon General William A. Hammond established in Washington the Army Medical Museum, the largest in the world. During the same period Jonathan Letterman developed the method of evacuating the wounded from the battlefield, now used by every army in the world.

George M. Sternberg, who became Surgeon General in 1893, discovered the pneumococcus, wrote the first textbook on bacteriology, established the Army Medical School, which had among its faculty W. W. Keen and Walter Reed, founded the Army Nurse Corps and appointed the Medical Board, consisting of Walter

Reed, James Carroll, Jesse W. Lazear and Aristide Agramonte, to study yellow fever in Cuba in 1900. He was President of the American Medical Association, as was General Gorgas.

In the Philippines the Army Medical Officers have managed the control of leprosy, cholera, small pox, malaria and beriberi; of bacillary dysentery, aided by the labors of Flexner, Barker and Russell; and of amoebic dysentery.

During the World War the Medical Corps had the first troops to go to France, the first officers and soldiers killed and wounded, the first prisoners taken.

The Medical Field Service School is at Carlisle Baracks, Pennsylvania, the oldest Army Post in the United States, established by the British, in 1755, to train officers for Braddock's army and continuously occupied since that time. This Service School began its instruction in 1920, training Reserve Officers, National Guard, R. O. T. C. and Naval Medical Officers. It has many distinguished graduates and has served as a model for other governments. It has graduated over 11,000 officers.

MEMOIR OF DR. JAMES CORNELIUS WILSON[1]

By J. M. ANDERS, M.D.

Dr. James C. Wilson, a former President of the College of Physicians, was a familiar and honored member of the medical profession of Philadelphia during many years. The memories of not a few of the former Presidents of this College, who have died, are sacred to us, and their influence is still felt in the everyday life of this great institution, as well as in the lives of many living fellows. Of such was the subject of this Memoir; he made a deep and lasting impress upon the minds of many fellows and was a worthy representative of the best among the ex-Presidents.

To those fellows who were his former pupils, his life will be a noble example, and his memory a precious heritage; likewise to a long line of resident physicians, who came within the sphere of his direct influence at the Lankenau, Jefferson and Pennsylvania Hospitals—institutions he served as visiting physician for many years. From the standpoint of both character and achievement he rose to an enviable position among his associates and professional friends. He carried on his professional work and other activities during the period of greatest advancement in our knowledge of the causation and specific control of acute and chronic infectious diseases—a half-century that witnessed greater medical progress than all previous eras combined. Moreover, he played a significant rôle in this unprecedented accomplishment.

Dr. James C. Wilson was a native of Philadelphia, born March 25, 1847, the son of Dr. Ellwood and Hannah Paul (Shallcross) Wilson. His father, who departed this life in 1889, was a widely known and greatly respected physician of Philadelphia. Dr. Wilson received his early education in the Friends' Central School of this city, after which he was graduated from Exeter Academy, New Hampshire. He then entered Princeton University, receiving his A.B. in 1867 and his A.M. two years later. In the same year he entered Jefferson Medical College, from which he was graduated in 1869. It may be of interest to note that he took

[1] Read before the College of Physicians, May 6, 1935.

up the study of medicine without much enthusiasm, but having undertaken it he was determined to make of it an eminent success.

Dr. Wilson served as resident physician in the Wills Eye Hospital and in the Pennsylvania Hospital. He then went abroad and pursued his studies in Vienna for one year, paying special attention to anatomy, pathological anatomy and clinical medicine. In 1873 he returned home and entered upon his active professional career, identifying himself at once with the Department of Medicine and Clinical Medicine in the Jefferson Medical College. He was made chief of the Medical Clinic and soon became a well-known quiz master. He served for several years as Chief Clinical Assistant to Professor J. M. DaCosta, during which time began the professional and social intimacy of these two eminent sons of Jefferson. About this time Dr. Wilson was also appointed lecturer on physical diagnosis in Jefferson College; and when the new Jefferson Hospital was built he was appointed one of the attending physicians.

Dr. Wilson's death closed a career that was remarkable for opportunities at the bedside, to which he was strongly attracted, and in the laboratory. He was indefatigable in availing himself of these advantages and, as a result, early became a clinician of the first rank, particularly from the viewpoints of accuracy of observation and sound clinical judgment. The impression made by that great master clinician, DaCosta, his immediate predecessor in the Chair of the Practice of Medicine and Clinical Medicine in the Jefferson Medical College, was, doubtless, deep and lasting. Dr. Wilson's admiration and feeling of reverence for his friend and one-time chief was unbounded, as shown by his personal expressions to the writer, and more particularly and eloquently told in his Memoir of Dr. DaCosta, presented to the College on November 5, 1902.

Dr. Wilson was not as prolific a writer as some of his contemporaries. Reprints of his articles, however, to be found in the Library of the College, number upwards of 100. His productions reveal an engaging personality and an exceptionally gifted mind, while his literary style has rarely been excelled. Dr. Wilson's breadth of view was shown by his timely article on "The Care of the Convalescent," which was read before this College on October 23, 1924. In it he defined the requirements of convalescent patients and also pointed out the obvious defects of then existing

small homes for this important class of patients. The progress of medicine had, up to that time, neglected "the patient who got over his sickness, but could not get well." He pointed out that "now and then a paper about him appeared in some medical journal, but they were few and aroused little interest."

Other writers, among them Thayer, had emphasized the need of convalescent departments in connection with large hospitals, "in which may be carried out every arrangement for the well-considered rehabilitation, mental and physical, of the convalescent patient." Dr. Wilson's article stressed the excellent quality of the work done in the hospital of the Burke Foundation and at Ivycroft, naming them as examples of institutions that should be multiplied throughout this country. Since his enthusiasm was infectious and the character of the service rendered by these institutions has been of the highest order, the wonder has been that more lasting interest was not aroused thereby.

During the last quarter of the nineteenth century typhoid fever prevailed extensively, no specific prophylactic agent for the control of this disease having been discovered; and tuberculosis had not yet begun to show a marked decline in incidence or mortality. It was during that period of time that classical papers from the pen of Dr. Wilson on different aspects of these two leading affections appeared in the medical press and, doubtless owing to their practical character, proved helpful to medical practitioners.

Dr. Wilson's monograph on acute and chronic alcoholism, which was among his earlier scientific contributions, is worthy of special mention. Subjects of general interest outside of his, the broadest and most important specialty, namely, internal medicine, such as tropical medicine, climatology, physical therapy and medical libraries were embraced by his contributions to medical literature.

Dr. Wilson was the author of a Hand Book of Medical Diagnosis, issued in 1909, which reached its fifth edition in 1919. Among other works were the following: "The Summer and Its Diseases" (1879), "A Treatise on the Continued Fevers" (1881), and "A Manual of Fever Nursing" (1887), which reached its ninth edition in 1919. He edited "An American Text-book of Applied Therapeutics," which appeared in 1896. Special mention should be made of a notable address at the unveiling of a

monument by the American Medical Association to the memory of Benjamin Rush, in 1904. Here should also be mentioned a brief, but classical, sketch in memory of one whom he greatly admired, Dr. S. Weir Mitchell, before the Philadelphia Medical Club, in 1914.

It has been given to few authors to express their thoughts with greater lucidity than did the subject of this Memoir, and equally few have shown the same broad, cultural background. This is clearly indicated in his addresses made, upon occasion, on non-scientific subjects, in verification of which I would here call attention to his article entitled "Aulus Cornelius Celsus and Some Remarks Concerning Rare Editions of Old Books and Medical Libraries," among others, which was read at the Annual Meeting of the Medical Library Association, at Washington, May 5, 1913. Some of the references to the author "A. Cornelius Celsus" might, with equal propriety, be applied to the subject of this sketch, J. Cornelius Wilson, as when they speak of "the purity of his style" and the "classical perfection of his language."

In 1891 Dr. Wilson was chosen to fill the Chair of Practice of Medicine and of Clinical Medicine at Jefferson Medical College, succeeding Dr. J. M. DaCosta; he occupied this important position until 1911, when he was made Emeritus Professor of the same subject. He was sometimes referred to as "the gentleman of the faculty." With Dr. Wilson's resignation as Professor of the Theory and Practice of Medicine in Jefferson Medical College, his career as a teacher ended, but his interest in his profession continued until near to the close of a distinguished and useful life.

It was due to Dr. Wilson's influence that the Sarah Magee Chair of Medicine was endowed at Jefferson Medical College. And, what is more important, it was through his personal efforts that The Magee Memorial Hospital for Convalescents, an endowed institution, is soon to be founded in Philadelphia, under the Will of the late Anna J. Magee. An excerpt from Miss Magee's last Will and Testament may appropriately be quoted here:

"It is my desire to commemorate my family name by rendering lasting service to the poor and by increasing the usefulness of the hospitals in my native city, Philadelphia.

"In order that my purpose may be accomplished, I desire to found and endow an institution to be called 'The Magee Memorial Hospital for

Convalescents,' whose object shall be the relief of the general hospitals of the City of Philadelphia from the burden of the support of patients who have passed through the active stages of acute illness or have recovered from injuries or operations, during a portion of that time which must necessarily elapse before they are able to resume their accustomed occupations or duties," etc.

Each of eleven Philadelphia hospitals named by the Testatrix shall have the right to elect a member of the Board of Trustees of the Magee Memorial Hospital. Dr. Wilson was nominated as the first physician, and to serve on the Board, and "in case of death, resignation or incapacity to act, the person who shall at the time be Professor of the Practice of Medicine and Clinical Medicine in the Jefferson Medical College, shall become his successor as physician and as a member of the Board of Trustees." Thus, by his unselfish efforts in this civic movement he rendered a lasting service to his alma mater, the medical profession of Philadelphia and the general public.

Among the many activities that crowded his fruitful career none was more devotedly pursued than the position of Physician-in-Chief to the Lankenau (then German) Hospital—a position to which he was appointed in 1897 and which he held until 1924, when he was made Emeritus. It was there that he applied the newer knowledge of that day in the treatment of typhoid fever by using cold tub baths. His results from this method were encouraging, showing as they did a reduced mortality when compared with other methods of treatment then in vogue. He was attending physician to the Philadelphia General Hospital from 1876 to 1890. In 1895 he was appointed physician to the Pennsylvania Hospital.

Dr. Wilson was a member of practically all local, state and national medical organizations, including the Pennsylvania State Medical Society and the American Medical Association, and was President of the following: Pathological Society of Philadelphia, 1885; Philadelphia County Medical Society, 1895–96; American Academy of Medicine, 1897; Association of American Physicians, 1902; American Climatological and Clinical Association; American Therapeutic Society, 1909; Philadelphia Medical Club, 1913; College of Physicians of Philadelphia, 1913–16; and was Vice-President of the American Pediatric Society. He was a member of the American Philosophical Society and of the Washington Academy of Sciences. In 1904 he was elected a member of

the Wistar Party. Dr. Wilson was consulting physician to the Philadelphia Lying-In Charity Hospital, the Rush Hospital for Consumptives, the Jewish Hospital and the Bryn Mawr Hospital.

Dr. Wilson's personality was distinguished, and his manner ever urbane and dignified. He observed the strictest courtesy in his relationships with members of his own family and maintained that it should begin with one's own household. Dr. Wilson was a man of proud, but not overbearing manner, which increased the respect in which he was held by his many faithful friends in and out of his profession. In his lectures and addresses to students and physicians he repeatedly stressed the importance of character building, as well as the far-reaching influence of character.

During the active period of his professional life as practitioner, teacher and author he earned for himself not only a national but also an international reputation. It was for his writings particularly that he was known and respected by the medical profession, both at home and abroad. As a teacher Dr. Wilson was not eloquent, but earnest and impressive. In person he was of medium height, his head well shaped, forehead broad and high, eyes bright, with somewhat prominent eye-balls —features which combined to give him an exceptionally intellectual and dignified countenance. Moreover, he was one of the best graced members of the medical profession of Philadelphia.

Dr. Wilson was an ardent fisherman, particularly fond of fly fishing for trout in company with his lifelong friend, Dr. William H. Greene, as well as of salmon fishing in New Brunswick. He possessed many relics of his hunting expeditions, of which he was exceedingly proud. He was also warmly devoted to the game of chess; this gave him much joy in his later years. Not a few intricate problems connected with this game were successfully worked out by him up to recent years, for which he received public recognition with seeming keen delight. He was fond of poetry and loved Shakespeare.

Dr. Wilson died October 28, 1934, at the age of 86 years. When he was about 30 years of age his physician, Dr. J. M. DaCosta, sent him to southern France, suffering from tuberculosis, where he remained two years. During the last 22 years of his life he carried an unusually low blood pressure. In these later years he suffered from attacks of gout, one of which lasted nine

months. Dr. Wilson did not attend any medical meetings during the last decade of his life, not because of any lack of interest in medicine, but on account of increasing deafness and the embarrassment caused by his being asked to comment on papers which he had not heard.

About the end of September, 1934, Dr. Wilson contracted a severe cold, followed by increasing physical prostration. Life was terminated quite abruptly by apparent coronary occlusion with pulmonary edema.

Dr. Wilson married Adele Beatrice Grosholz in 1882. Of this union there were two daughters, Beatrice Adele and Helen Natalie, who, with their mother, survive. A brother, Dr. William Reynolds Wilson, who formerly specialized in obstetrics, also survives.

Master of medicine, brilliant diagnostician, wise counsellor, sterling character, ardent advocate of high standards of ethics, and withal, a gentleman of the old school—such was the fellow whose memory we commemorate on this occasion—surely a worthy part of the heritage enjoyed by the fellows of the College of Physicians.

MEMOIR OF DR. HOWARD FORDE HANSELL[1]

By CHARLES E. G. SHANNON, M.D.

Dr. Howard Forde Hansell, an ophthalmologist of international reputation, died in Philadelphia, on November 5, 1934.

He was born in Philadelphia, on October 25, 1855, the son of Barnet Hansell and Rebecca Wetherill Hansell, both of English lineage. His grandfather, William S. Hansell, founded the saddlery business on Market Street in Philadelphia, while his grandfather on his mother's side was a prominent drug merchant on N. Front Street which was, at that time, a leading business center.

Dr. Hansell obtained his early education in the public schools of Philadelphia, graduating from the Central High School in 1873. Entering Brown University in the fall of that year, he pursued his studies with diligence, receiving the degree of A.B. in 1877, and A.M. in 1880. As an undergraduate at Brown University he associated with many young men who were destined to occupy places of prominence in all walks of life: T. Aldrich, cotton manufacturer and Brown benefactor; Charles Howard Johnson, late Chief Justice of the Rhode Island Supreme Court; William Paine Schiffield, former Congressman from Rhode Island; Rev. Willis Frye Thomas, D.D., noted British missionary to Burma; Judge William Grant Van Horne of the International Court of First Instance, Cairo, Egypt; and Fred Homer Williams, late Brown Trustee and prominent Boston lawyer. His roommate was the late Rathbone Gardner, one time leader of the Rhode Island Bar. He was a member of the Psi Upsilon fraternity.

The final year at Brown University was devoted mainly to biology as a preparatory step to the study of Medicine. Matriculating at Jefferson Medical College in the fall of 1877, he became a private student of Dr. J. C. Wilson. In 1879, he received the degree of Doctor of Medicine. Following his graduation, he was appointed Assistant in the Medical Clinic under Prof. J. M. DaCosta and in the Ophthalmological Clinic under Prof. William Thomson.

[1] Read before the College, May 6, 1935.

In 1880, Dr. Hansell went to Europe to pursue further his studies in ophthalmology to which he had decided to devote his entire attention. In Berlin he received clinical instruction under Prof. Herschberg and in Vienna, under Drs. Fuchs, Stelwag and Arlt.

Upon his return to Philadelphia he was appointed Clinical Assistant under Prof. Thomson and later became Chief of Clinic in the Department of Ophthalmology at Jefferson Medical College Hospital.

Coincident with his advancement at the Jefferson Medical College Dr. Hansell joined the staff of the Polyclinic Hospital, later becoming Professor of Ophthalmology at that institution. He was elected President of the Faculty for four successive years. He also received the appointment at the Philadelphia General Hospital as Attending Ophthalmologist, a position he held for over twenty years.

In 1904, he became Professor of Ophthalmology at Jefferson Medical College, succeeding Dr. George E. deSchweinitz. In 1926, following his resignation from active duty on the Faculty, he was made Emeritus Professor.

Dr. Hansell contributed extensively to the various ophthalmic journals throughout his career. Among some of his more important papers may be mentioned: "History and Study of the Practice of Refraction of the Eye in Philadelphia"; "Some Observations in Ametropia and Heterophoria"; "Luetic Ophthalmitis"; "Treatment of Retinal Detachment"; "Accommodation in Myopia"; "Healthy Habits in Reference to Preservation of Vision"; "High Hyperopia from a Clinical Standpoint"; "Report of Fifty Cases of Homer-Smith Preliminary Cystotomy"; and "A Brief Report of Four Cases of Atypical Retinitis Pigmentosa." This last paper was read before the Oxford Congress in 1924 and received wide and favorable comment.

His major literary works were: "Clinical Ophthalmology," Hansell and Bell, 1892; "Muscular Anomalies of the Eye," Hansell and Reber, 1899; and "Text-book on Diseases of the Eye," Hansell and Sweet, 1903.

In 1920, he was a member of the Committee (made up of Howe, Hansell and Schneidemann) appointed by the Section of Ophthalmology of the American Medical Association to report upon the selective investigation concerning the ocular muscles.

Dr. Hansell was also a member of the Pennsylvania State and

Philadelphia County Medical Societies, the American Medical Association and the American Ophthalmological Society. He was elected a Fellow of the College of Physicians of Philadelphia in 1886, and served as Chairman of the Section of Ophthalmology from 1907 to 1908 inclusive.

His private practice, in the course of time, became extensive and yet each patient, regardless of his station in life, received every consideration. He was scrupulously honest with his patients, as he was in all other matters. Any evidence of quackery that came to his attention received his utter condemnation.

Dr. Hansell was quiet, reserved and of a studious nature, yet he possessed a very keen sense of humor.

His lectures, always carefully prepared, were well attended. I can recall his interesting presentation of the cases to the class during my senior year, interspersed with witticisms that brought considerable amusement to the members of the class. He always spoke clearly and with ease. Rarely has a lecturer been more highly respected by the student body.

Dr. Hansell was married to Emilie Read Vogdes, the daughter of General Israel Vogdes, U. S. A., on January 3, 1887, in Grace Church, New York City. This marriage proved an exceedingly happy one, one son, Howard Forde, Jr., being born of this union.

For many years it was the custom of Dr. Hansell to travel abroad during the summer months, visiting the various European clinics. In 1914, he visited the clinic of Stanculeanu in Bucharest, Roumania, to make a special study of his method in cataract extraction. It was on his way home that he and Mrs. Hansell were temporarily held up in Russia by the outbreak of the World War, and his recital of the trials and tribulations that beset them during their escape and return to the United States unfolded a stirring narrative.

With his retirement from active practice Dr. Hansell decided to spend the greater part of his remaining days in those cities abroad to which he had become attached during his earlier travels. He had only recently returned from Europe when he was stricken with his final illness.

The death of Dr. Hansell came as a distinct shock to a host of medical friends and admirers, not only in Philadelphia but throughout the country, for, though of a decidedly retiring disposition, he had by years of earnest, kindly living endeared himself to many, both in and out of the profession.

MEMOIR OF DR. EDMUND BROWN PIPER[1]

By BARTON C. HIRST, M.D.

The Subject of this memoir, Dr. Edmund Brown Piper, was born in Williamsport, Pa., April 20, 1881. Receiving his preliminary education in the Cheltenham Military Academy, he entered Princeton University, graduating with the degree of B.S. in 1902. For the next five years he was in business with the Williamsport Water Company.

Deciding to adopt a profession, Dr. Piper entered the Medical School of the University of Pennsylvania, graduating in 1911. Following an interneship in the Children's Seashore House, Atlantic City, the Mercy Hospital, Pittsburgh, and in the University Hospital, he served as Chief Resident in the latter for two years, entering the practice of medicine in 1914, with special attention to obstetrics and gynecology, in the same year receiving an appointment as Associate in Obstetrics in the Medical School. In 1915 Dr. Piper went to France with the University Unit of the Ambulance Service. On his return he devoted himself entirely to his specialty, but his medical career was again interrupted in 1917 by our entrance into the World War, when he went to France with the rank of Major, commanding Camp Hospital No. 41 and Field and Camp Hospitals Nos. 42, 48 and 50. In May, 1919, he was cited by General Pershing for "exceptional, meritorious and conspicuous services at Camp Hospital No. 41, A.E.F." He was discharged from active service April 10, 1919, and in March, 1920, was commissioned Lieut. Colonel, M.R.C. and was recommissioned with the same rank in 1925. At the conclusion of the war he resumed his special practice with an indefatigable energy and unmistakable ability that secured him, in an amazingly short time, an unusual recognition and opportunity to develop himself. There follows a chronological list of his appointments.

[1] Read before the College, May 6, 1935.

Assistant Obstetrician on the staffs of the University and the Philadelphia General Hospitals, Obstetrician to the Maternity Hospital of Philadelphia, Obstetrician in Chief to the Bryn Mawr Hospital, Obstetrician to the Philadelphia Lying-in Hospital, Obstetrician to the Chestnut Hill Hospital, Obstetrician and Gynecologist to the Philadelphia General Hospital, Chief of Service of the Obstetrical Department of the Pennsylvania Hospital, Obstetrician to the University Hospital, Professor of Obstetrics in the University Medical School and in the Graduate School of Medicine of the University, and Consultant in Obstetrics to the Bryn Mawr Hospital, Kensington Hospital for Women, Misericordia Hospital and the Preston Retreat, as well as staff positions in other hospitals.

Such rapid advancement to so many important positions was a rare achievement, all the more admirable that it was due to merit and to no extraneous influences.

In addition to his clinical and teaching positions he was a member of the following professional societies:—The College of Physicians of Philadelphia; American Gynecological Society and Club; American College of Surgeons; Philadelphia College of Surgeons; The Pathological Society of Philadelphia; Philadelphia Obstetrical Society (President 1924); The Philadelphia County Medical Society; Pennsylvania State Medical Association; American Medical Association; and The Medical Club of Philadelphia.

In 1922 Dr. Piper published the results of experiments in animals, proving the possibility of sterilizing the blood current with mercurochrome in cases of septicaemia. After establishing the proper intravenous dose per kilo weight, the method was successfully applied in human beings.

He had an inventive genius. His axis traction forceps, an outlet forceps, a modified leg holder were distinct improvements on the older models, and his original aftercoming head forceps is generally admitted to be the most important contribution to the armamentarium of obstetrics in recent times. In his practical work he showed manual dexterity, good judgment, decision and imperturbability, confronted with serious emergencies. He developed a skill in version comparable with that of Dr. Potter, whose name is usually associated with the operation in the medical mind.

As a teacher his forceful personality, large experience and capacity to impart information gained him the respect and affection of his students. He took particular interest in an extramural course to sections of the class on premarital advice, given frankly but with propriety and delicacy.

This brief sketch of Edmund Piper, the physician and teacher, does him scant justice without a tribute to the man's character, difficult to render with becoming restraint by one of his closest friends, who keenly feels his loss. His good humor, wit, exuberant vitality and joy of living made him a delightful companion, but such qualities do not explain the devotion of his many friends, nor in my case a cordial, affectionate friendship without a break for twenty years, under circumstances that might easily have caused misunderstandings. In the German Medical Schools it was long a custom never to elect the successor to a Professor from one of his Staff. Dr. Piper made no secret of his ambition to succeed his Chief. Nevertheless, there was no trace of disloyalty on the one side nor of jealousy on the other. One does not usually analyze a friendship. It exists unquestioned of its cause. Had it ever occurred to me to ask myself why I esteemed so highly my departed friend, the answer would have been, partly a natural response to his affection for me, but mainly an admiration of his distinctive traits of courage, loyalty and truth.

Dr. Piper from his twelfth year might have led the life of an invalid on account of grave heart disease. Ignoring the ever present possibility of sudden death, echoing Ovid, "Come when it will, The day that ends my life's uncertain term," unafraid, he ordered his life as he determined it should be, a strenuous existence, full of varied activities. In one of his exploits, driving his car at furious speed across the continent and back, he seemed to flaunt defiance in the face of fate for inflicting on him the one defect in an otherwise perfect physique.

He was the soul of loyalty to his friends, with his kindly and generous disposition exalting their good qualities and often deprecating what he mistakenly considered defects in himself. He was truth personified, incapable of guile, pretense, affectation or equivocation. His convictions were strong. He was easily angered by what seemed to him unjust or wrong, but he never harbored rancor. He said what he thought without reserve, sometimes unconsciously giving offense by his frank opinions.

During his later years there were distressing attacks of cardiac decompensation, with other extremely painful complications, one requiring a major operation, but never once was there loss of patience, equanimity or courage. He died suddenly January 14, 1935, while apparently improved in health.

In his death medicine lost a colorful, forceful, unusual figure; his friends, a beloved comrade whose memory they will always cherish.

MEMOIR OF DR. THOMAS McCRAE *

By JOHN H. GIBBON, M.D.

Thomas McCrae, a Fellow of this College (1913) died on June 30, 1935, and having been assigned the sad task of presenting to the College a memoir of him, the writer regrets that so much of the time allotted for its reading must necessarily be taken up with the recording of data in regard to his career with which the Fellows are familiar, for it would be much more agreeable and interesting to devote the whole time to the character and accomplishments of this distinguished man.

McCrae was born in Guelph, Ontario, on December 16, 1870. His father was Lt. Col. David McCrae, and his mother Janet Eckford—both Scotch. Mrs. McCrae has been characterized by one who knew her well as "a rare woman (though not so rare in Scotland)." It was from her that her two sons, John and Tom, inherited a delightful sense of humor, the former to a degree that made him quite famous. Tom's humor was of a quieter, more subtle type. The McCraes were of "an old Galloway fighting stock" (*Brit. Med. J.*, July 12, 1935). During the World War, Col. McCrae, at the age of seventy, recruited and trained a field battery which he subsequently took to England. He was much chagrined that because of his age he was not allowed to accompany this battery to France.

John McCrae, in spite of the fact that he was a physician, served in the artillery during the Boer War and went to France during the late war as an artillery officer. He was later transferred to the medical service and died in France. To all English speaking peoples he will ever be known as the author of "In Flanders Fields."

Thomas McCrae had the rank of Lt. Colonel in the medical corp of the Canadian army and, for some time, headed the medical service of a Canadian General Hospital in England.

In 1891 McCrae received his A.B., in 1895 his M.B., in 1903

* Read January 6, 1936.

his M.D., and in 1927 his honorary D.Sc., all from the University of Toronto. In 1901 he was made a Member of the Royal College of Physicians of London, and in 1907 he became a Fellow. These two latter degrees, unlike similar ones in America, are only won by hard work and stiff examinations.

After graduating, he served an interneship in the Toronto General Hospital. In 1899 he studied at the University of Göttingen, and on his return went to Johns Hopkins—like many other later distinguished Toronto graduates, Barker, Cullen, Futcher, MacCallum, and his brother John. His first position was that of Resident Medical Officer, then in 1901 he was made Instructor in Medicine, and in 1906 Associate Professor of Medicine. It was in Baltimore during these years that he became so intimately associated with William Osler, a friendship and association which continued until Sir William's death. In 1908 he married Osler's niece, Amy Gwyn, who survives him after twenty-seven years of happy and congenial married life. They had no children, and his brother John having never married, Tom was the last of the American McCraes.

Although firmly and contentedly rooted in Baltimore, there came in 1912 a turning point in McCrae's career, for in that year he was elected Professor of Medicine at the Jefferson Medical College, succeeding James C. Wilson, a distinguished Fellow and President of this College. In February, 1913. he was elected an Attending Physician to the Pennsylvania Hospital, where he made excellent use of the wealth of material for teaching small groups of students in his wards. He came to Philadelphia as an alien and comparative stranger, but his qualities soon won for him many devoted friends and admiring acquaintances. His ability as a teacher and his practical sense in the application of his medical knowledge and experience were soon recognized, and in a few years he became a very definite and integral part of the city's medical and social life.

Of McCrae's contributions to medical literature little need be said, for their character insured extensive reading and frequent quotation. His monumental work was, in association with Osler, "Modern Medicine" in seven volumes. He also had his part in the many editions of Osler's "Principles and Practice of Medicine." A distinct honor came to him in 1924 when he delivered the Lumleian Lectures at the Royal College of Physicians of

London, and last year he was made an Honorary Foreign Member of the Association of Physicians of Great Britain and Ireland, the only other foreign recipients having been Chauffard, Widal, Thayer and van den Bergh. Early in his career McCrae showed a lively interest in the history of medicine, writing "Benjamin Jesty: A Pre-Jennerian Vaccinator," "The History of St. Bartholomew's Hospital" and "George Cheyne." Later he became an Associate Editor of the *Annals of Medical History.*

He took an active interest in all the societies to which he belonged. In this College he was for years a member of the Library Committee and was elected several times to the Council. He was Secretary of the Association of American Physicians from 1917 to 1926 and its President in 1930. He was also a member of the American Philosophical Society and of the Charaka Club.

It is as a teacher that he will be affectionately remembered by hundreds of students of the Hopkins and of Jefferson. He knew just what the student of medicine needed to acquire and he developed a great skill in imparting it to him. He was not the witty didactic lecturer that his colleagues, Da Costa and Hare, were but he was a better teacher because he believed in, and practiced constant and intimate contact with small groups of his students. He loved teaching, as most good teachers do, and never, even in his last miserable years of ill health, tired of it. His intimacy with his students was always dignified and confined to the subject under consideration. Any form of familiarity was discouraged by the respect and sometimes the awe which the students had for him. He was always kindly and considerate but would wax irate when met with stupidity or laziness, as many students and internes can recall.

His colleagues in the faculty and on the hospital staff could always count on his seeing straight and acting courageously. At staff and faculty meetings he expressed himself frankly and regardless of expediency.

The avocations and hobbies of distinguished men are always interesting and are often far removed from their vocations. McCrae was a good example of a man who is a slave to duty, and I think it was because of this that he rarely indulged himself in any extraneous relaxation. He never allowed anything, however alluring, to distract him from his work. His vacations were spent in travel and reading. His recreations were distinctly intellectual.

McCrae possessed a kindliness, a thoughtfulness and a sympathy for others about which he, like so many Britishers, was sometimes orally inarticulate, but which revealed themselves in easy delightful written words, as those who have received his sympathetic notes of congratulation or of condolence well know. The dour seriousness of him, apparent on occasions, appropriate ones, was only a thin shell covering a soft and kindly kernel. Injustice and unfairness readily opened this shell to the victim and as quickly closed it again to the perpetrator. McCrae possessed among other virtues, modesty and the avoidance of self aggrandizement which, in this acquisitive world, usually go unrewarded.

> "Steel true and blade straight
> The great Artificer made" him.

MEMOIR OF DR. CHARLES ANDREW FIFE *

By JAMES E. TALLEY, M.D.

Charles Andrew Fife, M.D., died at the Presbyterian Hospital in Philadelphia, June 15, 1935.

I can but repeat the biography which Dr. Hamill [1] has so well portrayed and then turn to the more personal side of my relation with Dr. Fife in practice over many years.

Dr. Fife was born in Circleville, Westmoreland County, Pennsylvania, December 22, 1871. He was a son of the Reverend N. H. G. and Mary Elizabeth Paull Fife. He was of Scotch descent on both sides of the house. His original paternal ancestor came to this country in 1758, and his maternal American ancestor arrived about 1740. The records of his progenitors were interesting, for they were people of outstanding attainment. His maternal great-grandfather joined the Continental Army in 1778 when he was 17 years old, and eventually attained the rank of Lieutenant Colonel.

Dr. Fife graduated at Leland-Stanford University in 1894 with the degree of Bachelor of Arts, and from the Medical Department of the University of Pennsylvania in 1897. He served as an Interne at the Methodist Episcopal Hospital in Philadelphia and later spent a year in post-graduate study in Vienna and Berlin. Returning from Europe he located in Philadelphia as an internist and was associated first with Dr. David L. Edsall and later with the late Dr. John H. Musser. During these years he engaged in research in the Department of Physiological Chemistry, in the William Pepper Laboratory of Medicine and also in the private laboratory of Dr. Musser. For some ten years he continued general practice but was especially interested in pediatrics; after that time he limited himself to the latter field alone.

With the rank of captain in the Medical Corps of the United States Army, he went with the Presbyterian Hospital Unit of

* Read January 6, 1936.

[1] *American Journal of Diseases of Children,* October 1935.

Philadelphia to France. On arrival he was transferred to the office of the Surgeon of the American troops in Paris, and later was assigned to Evacuation Hospital No. 4. In August, 1918, he was advanced to the rank of Major, and in October of the same year he was transferred to Base Hospital No. 34 as Chief of its Medical Division. His war service was highly regarded by his superior officers. In March, 1919, on his return to the United States he was mustered out with honor.

In September, 1930, Dr. Fife married Mary Sellers Febiger of Philadelphia.

In the course of his medical career he served as Pediatrician to the following hospitals: St. Christopher's Hospital for Children, Philadelphia General Hospital, the Presbyterian Hospital, the Mary J. Drexel Hospital for Children, the Germantown Hospital and the Maternity Department of the Lankenau Hospital.

Dr. Fife was one of the founders of the Babies' Hospital in 1911 and served as President of its Board of Managers for twelve years. Then, until his death, he served as Chairman of its Committee on Medical Administration. Until 1932, he was Associate Professor of Pediatrics in the Graduate School of Medicine of the University of Pennsylvania, and before this he had served as Associate Professor of Pediatrics in the School of Medicine of the University of Pennsylvania. In 1933 he was President of the American Pediatric Society, and in the same year he received the honorary degree of Doctor of Sciences from Dickinson College.

His contributions to the literature of medicine were sound and well worked out, though not numerous.

His presidential address before the American Pediatric Society [2] was delivered practically a year before his death. Rarely does one have an opportunity to take the measure of a man so clearly and so concisely from his own words. It is called "The Child's Family Adviser," but I know of no five pages which any medical man, young or old, could read and ponder with better advantage with respect to his philosophy of the practice of medicine.

During the last few decades surgery has made great strides and internal medicine as well, but recently internists have awakened to the fact that we have prepared to treat the physical and neglected the psychic man. More recently we have realized and

[2] *American Journal of Diseases of Children*, July 1934, **48**, 1–5.

stressed the unity and mutual dependence of body and mind. Recently the President of this College [3] dwelt upon the necessity of every internist being somewhat of a psychiatrist, and the converse is true. Nowadays we hear also, and rightly, more of the neurodermatoses.

Dr. Fife sensed these deficiencies in practice, and also that while specific and constitutional diseases are on the decrease, functional neuroses or mental aberrations are on the increase; at least, we hear it repeatedly said that there are more beds in the United States occupied by mental and nervous diseases than by all the surgical and medical cases combined. Since the basis of the functional neuroses are often laid in early life, the child's family advisor should be prepared to treat both its physical and mental ills. Abnormal behaviorisms in childhood if not corrected lead to asocial or antisocial attitudes in later life, which, according to Jensen, constitute the bases of the functional neuroses. Therefore, it is especially necessary for the child's family advisor to know the elements of sane psychology, psychiatry, bionomics, something of sociology and of all activities for child-welfare. He should be able to recognize those factors which may affect adversely proper personality formation and personality functions. "To do this the pediatrician should foregather with parents, nurses, nutritionists, social workers, public health agencies, seasoned psychologists and especially psychiatrists."

Dr. Fife and I worked together in an active general practice on the outer fringe of West Philadelphia, in the winter of 1900 and 1901, just before he went abroad to study. The picture of practice in those days had features which are more or less lacking, or changed, in practice to-day. They are well known only to the older members of the College, I shall mention a few of them. Especially in the autumn, the medical wards of the hospitals were practically given over to typhoid fever, and even during the winter and spring one's list was rarely free from it. It has been said that the amount of typhoid in a community is an indication of the sanitary intelligence of that community. Perhaps that was less true in those days than it is to-day. Philadelphia's present comprehensive sand filtration system was begun in 1902, and with its completion there was an immediate drop in the typhoid morbidity rate.

[3] *Annals of Internal Medicine,* September 1933, 7 (O.S. **XII**), 281.

Chicago's new drainage canal, one of the greatest sanitary works in the world, was finished about 1900. A member of the Cook County Hospital staff told me that previous to the opening of this canal they had in Cook County Hospital as many as 325 cases of typhoid fever at one time, but that about 2 or 3 years after the opening of the canal they hardly had enough cases to demonstrate to the students.

Preventive inoculation against typhoid fever was as yet unknown. The beneficence of this discovery plus sanitation is demonstrated by the fact that of the 107,973 soldiers mobilized during the Spanish-American War practically one-fifth of them had typhoid, and there were 1580 deaths, while in the World War with millions mobilized, from September 1, 1917, to May 2, 1919, there were but 213 deaths from typhoid fever.

Diphtheria antitoxin of domestic make had been placed in the hands of medical men in 1894, so that by 1900 one approached a case of diphtheria with an optimism he had not known previous to that time. Still, preventive inoculation was practically unknown, so that the disease was always present. Certified and pasteurized milk were still in their infancy. It was no uncommon sight to see the farmer dipping milk from a large can into the family receptacle and flies swimming in the milk before it reached its proper place in the house. At a spring house not far from the center of the 69th street section I once saw a man busily washing milk cans with one hand, who told me that his other hand was tied up because the doctor had opened a felon for him that morning. These things make it easy to understand why gastroenteritis among children was among the banes of practice in those days.

Scarlet fever, measles, pneumonia, erysipelas, rheumatic fever were common. The second and third stages of pulmonary tuberculosis were far too common, as was lead poisoning, and occasionally then one had a real case of malaria. There were few active general practitioners who escaped doing some maternity work, and when in addition an epidemic, influenzal in nature, struck the community, the days and nights were a nightmare.

This was the sort of baptism that Dr. Fife had into general practice, but the turmoil seemed not to disturb his calm. He was quiet, unhurried, unruffled, tenacious, thorough; took a broad view of the whole problem, even though his patients were among

the humblest. If Mark Hopkins on one end of a bench and his student on the other constituted a college, then Charles Fife in an old dilapidated house, devoid of proper sanitary arrangements, surrounded by Italian parents, who spoke no English, and eight children, the oldest of whom interpreted, might be said to constitute a pediatric center. None of these things seemed to discourage Dr. Fife in trying to teach them a better way to live. In this special case he did his job so well that the memory of it lingered in the parents' mind, so that 35 years later, when the father was stricken with a fatal pneumonia, he summoned us to see that everything possible was being done. There was nothing missing, from serum, oxygen tent, to collapse of the lung if necessary. This immigrant, in less than forty years, by the hard work of a common laborer, by frugality and by giving the children a chance in school, had attained the broader life without a single spoonful of government pap. Probably no one within or without the government had ever instilled into his mind that he was the under-privileged or the forgotten man. We both realized the short-comings in our work as we had hoped to do it, but of this experience Dr. Fife writes in his article "The Child's Family Adviser": "A portion of early practice had best include some general family practice. This opinion is old fashioned and is not rated in the officially established standards by which the competency of men to practice pediatrics is estimated. However, for a person who aspires to be a child's family adviser such a training is of the utmost value, because the practitioner gains a broad outlook on human reactions and relationships and through his professional contacts with the adults of the household secures an understanding of the effect of discord, of ill health, of fatigue and of emotion on the psychology and behavior of parents, grandparents and nurses and on the reaction of this on the children."

Dr. Fife enjoyed hunting, and he had many trophies of large game obtained in British Columbia, among them the elusive mountain sheep and mountain goat. He was a keen fisherman and there is a little French village in Canadian Labrador, that land of salmon and trout, which knows his prowess. Keen fisherman though he was, even in his vacations he never lost his humanitarian impulses and a chance for usefulness. The nearest doctor to this small village is 35 miles away and can be reached in summer only by an occasional steamship or small motor boat, and in

winter by dog sled or occasionally by mail air-plane. Morning and evening the villagers felt free to come to Dr. Fife for advice and treatment, and here again he did more than treat the immediate ill. He was instrumental in a large measure in helping them obtain a proper water supply. The summer is short and the soil is scant, so they have very few vegetables and no fruit except wild berries. This particular spot is rugged and rocky, so that even the moose and deer keep farther to the south and west where the vegetation is better. This is the country where the caribou begin. On account of this lack of forage, the few cows the villagers have give milk insufficient in quantity and quality. As the only work for men is fishing in summer and fur hunting in winter, they can not afford to buy much food from outside, especially since the depression has ruined both fish and fur markets. Their staple diet is bread, fish, potatoes, and a little bacon if they can get it. There are no eggs because there are no chickens, for feed would be too expensive. Their little garden patches contain potatoes, which are still in blossom in early September with frost not far away, a few turnips, a few heads of cabbage, a little rhubarb. With insufficient milk and insufficient vegetables it is no wonder that their teeth are especially bad. But they have learned something about vitamins, so that the livers of the cod, halibut and seal are now finding their way into human stomachs instead of that of the huskies, a team of which is almost a necessity of every family. They cannot possibly afford oranges but they have learned the value of canned tomatoes and their vitamin content, and mostly through Dr. Fife's efforts.

Dr. Fife holds an abiding and affectionate place in our hearts because of his modesty, his humanity, his breadth of vision, his entire lack of pettiness, his thoroughness in all he did, his devotion to children and the stability of his friendship. Knowing his work and his ideals we might use for him the phrase of the astronomer, "He had loved the stars too fondly to be fearful of the night."

MEMOIR OF DR. BARTON COOKE HIRST *

By WILLIAM R. NICHOLSON, M.D.

Dr. Barton Cooke Hirst died September 2, 1935, at his residence, 1821 Spruce Street, Philadelphia, of acute dilatation of the heart. He was born in Chestnut Hill, Philadelphia, on July 20, 1861, the son of William Lucas Hirst, a prominent attorney, and Lydia Barton Cooke. His family tree is traced in England as far back as the 12th century, the American branch of the family springing from John Hirst, who emigrated and settled in Bethlehem, Pennsylvania, in 1749. The family tradition was the law, there having been generations of Dr. Hirst's forebears in Temple Bar, London, and his decision to study medicine was an early evidence of the independence of thought which was always one of his salient characteristics.

Dr. Hirst married Elizabeth Haskins Dupuy Graham of Philadelphia in 1890, who survives him, as do also a daughter, Mrs. Elizabeth Dupuy Graham Lippincott, and two sons, Barton, Junior, an aviator in the late War, and Dr. John Cooke Hirst, 2d, an obstetrician of Philadelphia. The third son, Thomas, a 1st Lieutenant in the 151st Field Artillery, died in action in the late War.

Dr. Hirst entered the College Department of the University of Pennsylvania from the Faires Academy with the Class of '82, but at the end of his freshman year, having made up his mind as to his life work, another example of his independence and of his early maturity, he entered the Medical School, graduating with the Medical Class of '83. Subsequent to his graduation in medicine he served as an interne in the University Hospital and then studied in Heidelberg, Vienna, Berlin and Munich, where he became an interne with teaching duties. This Munich appointment probably had a great deal to do with his lifelong fight for better teaching in obstetrics in the United States. At the time of this appointment at Munich, eighteen months after his own graduation, although he

* Read January 6, 1936.

was a graduate of the highest type medical school in the United States, he had never delivered a woman, while on the other hand the students whom he had to teach and direct had made many deliveries. It goes without saying that a man of his mental attributes could not but make an odious comparison between the teaching abroad and that in the United States. In any event, we know that the practical training in obstetrics for students became one of the ruling passions of his life. When he returned to Philadelphia and was made an assistant to Dr. R. A. F. Penrose, the then Professor of Obstetrics at the University, there was not a bed devoted to this branch of medicine in the hospital, and no arrangements for extramural student obstetrics. As soon, however, as he was elected to succeed Dr. Penrose in the professorship, he filled both of these needs by establishing a maternity department in the hospital and by creating an extramural service for home deliveries by senior students under close supervision. This latter service was and is still known as the Southeastern Dispensary. Until Dr. Hirst's retirement from the undergraduate school he remained largely responsible for its financial support.

At the time of his election to the Chair of Obstetrics at the University the Medical Faculty was probably the most famous in the history of the school; Agnew, Wood, Pepper, Piersol, Reichert, Norris, Leidy, Wormley, Goodell and Tyson form a company which might well have given pause to a new member whose life span at that time was 29 years. That he was impressed goes without saying, but by his sheer professional ability and his ever present tact he was able to make himself acceptable to all of them, no mean feat. It is noteworthy that Dr. Hirst was only the fifth man to hold his Chair since the first incumbent, Dr. James, who was elected in 1810, the others having been Dr. Dewees, who held it for only one year, and Drs. Hodge and Penrose. Really, therefore, it may be said that four men, James, Hodge, Penrose and Hirst, have divided the occupancy of this Chair for one hundred and seventeen years. Dr. Hirst occupied the Chair of Obstetrics in the University for 38 years, delivering three lectures, or their equivalent, each week to crowded benches, and also personally conducting the large clinical service which he attracted to his ever growing department. The funds needed for new buildings were obtained to a large extent by his personal solicitation and it must not be forgotten that he did a vast amount of gynecology as

well as obstetrics in his service, being one of the pioneers in this regard, in that he believed in, taught and fought for the interdependence of obstetrics and gynecology, at that time not generally conceded. He felt most strongly that no man unless he was a skilled pelvic surgeon could be considered a safe obstetrician and that the reverse was also true, an opinion now almost axiomatic in the minds of those competent to judge, but at that time a very heterodox opinion in most quarters.

When he retired on age, in 1927, from the Chair of Obstetrics in the undergraduate school he was by far the oldest member of the Faculty in point of service. The Trustees of the University, who in 1907 had conferred upon him the B.A. degree as of the Class of '82, and who subsequently had given him the honorary Doctor of Science degree, elected him, on his retirement from the Chair of Obstetrics, as an Emeritus Professor of Obstetrics in the undergraduate school, and on the amalgamation of the Howard Hospital with the Graduate School of Medicine of the University they again elected him as Professor of Obstetrics in that institution. He held this position until his death, conducting a very active teaching and operative service with the enthusiasm that was his in 1889 and with the ability and knowledge that his ripe experience had brought to full fruition.

Dr. Hirst held many and various positions in the medical world. He was proud to have been the Chairman of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, and also to have been one of the founders of the American College of Surgeons. He was an enthusiastic member of the American Gynecological Society and one of its ex-presidents. He was a Fellow of the College of Physicians of Philadelphia since 1888. He was the only member of the Philadelphia Obstetrical Society ever to be elected three times as its president. He was a corresponding member of the Society of Obstetrics and Gynecology of Paris; Consulting Surgeon to the Paris Society of Foreign Surgeons; an Honorary member of the Obstetrical Society of Edinburgh and also of the Belgian Gynecological and Obstetrical Society. The University of Pittsburgh gave him the honorary degree of Doctor of Laws.

His additional hospital activities in Philadelphia, aside from the University Hospital and the Hospital of the Graduate School of Medicine, comprised staff membership formerly at the Phila-

delphia General and the Howard Hospital, and laterly until his death he was active on the staff of the Orthopedic and the Lying-In Hospitals. The writer always felt that his first and greatest love was to the Howard Hospital, in which for many years he was the main spring. In fact, from the time of his election to the Howard Hospital until its amalgamation with the Graduate School of Medicine of the University it is no exaggeration to say that he was the most active member of its staff. It is a pleasure to bear witness to the fact that after the Howard had become an integral part of the Graduate Hospital Dr. Hirst transferred his allegiance to that institution.

In his earlier years he was a prolific writer. The American System of Obstetrics, edited by him, his Atlas of Gynecology, Human Monstrosities as co-editor with Piersol, and his own two text books, the one on Obstetrics and the other on Diseases of Women, bear ample witness to this fact, not to mention his many scattered articles and papers.

Such is the imperfect record of his achievement and truly it is an enviable one, but to the many who knew and revered him it portrays but the shadow of the man himself. The writer had peculiar opportunities to appraise Dr. Hirst at his true value, first as his student, some years later as an assistant on his staff and as quiz master under him, and for the past eight years as his colleague in the Graduate School of Medicine, and the attributes which have indelibly impressed themselves were his modesty, his constant courtesy, his kindness which was unfailing, his interest in young men, his enthusiasm for the newer developments in medicine, his keen sense of humor which made him enjoy a joke on himself at least as much as when another was the subject, an unusual trait, and his marvelous vitality, both physical and mental. Even during the past summer he followed his usual custom with regard to swimming, golf and sailing, and he continued to operate to the end of his life and within two weeks of his death devised a new technic for operative sterilization.

As a consultant he was without a peer, not only in his knowledge but in his manifest sympathy with the patient and his meticulous courtesy to the physician. He was an omnivorous reader and a great sufferer from insomnia, and this combination resulted in his being thoroughly conversant with general literature, while his interest in art and music must be emphasized. He

was the life of the 5 p.m. social gatherings of medical men in the old days at the University Club before his particular *bête noire*, prohibition, put an end to them. In medical societies he was a most delightful essayist, and his discussions of the papers of other men were always courteous, but he never hesitated to be critical when criticism was indicated.

He was a great teacher in the fullest meaning of that term, and in the opinion of thousands of undergraduate students of his day he was by far the best lecturer in the Faculty. When it is remembered that actually several thousand men sat under him during his 38 years of teaching, and that what he taught them has been utilized in their daily work among countless women patients, it must be felt that this alone would have been an enduring monument to his memory, even had he done no other meritorious work as a medical pioneer in obstetrical teaching and as a writer.

In his death, premature for him even at his age, medicine has lost an outstanding figure, obstetrics has lost one of the last of the pioneers, and his many friends and colleagues have an abiding sense of a loss which can only increase as time passes.

MEMOIR OF DR. ALEXANDER CREVER ABBOTT *

By WILLIAM PEPPER, M.D.

Alexander Crever Abbott was born in Baltimore, Maryland, on February 26, 1860. He attended Baltimore City College but after three years, not liking his school work, he left and in the spring of 1877, apprenticed himself as a machinist's apprentice in the Baltimore and Ohio Railroad shops in Baltimore. The contract was for four years; the hours 7 A.M. to 6 P.M.; the pay 70 cents a day the first year, increasing to a dollar a day the fourth year. At the termination of his apprenticeship, he received a bounty of seven and one-third cents for every day worked. in a lump sum. He did not like the work but, nevertheless, he finished his four years as an apprentice. He had helped build and repair many locomotives and knew them inside and out. He says in his reminiscences that when he finished and drew his bounty it was like "awakening from a horrible nightmare." I cannot help but believe that this early experience had a valuable influence on Dr. Abbott's later development.

His reminiscences † are in two bulky volumes, one labeled "Civil" and the other "My War Diary." These have been of great help to me in writing this memoir.

When he left the shops he knew not what to do; he was not prepared for business or a profession. It so happened that at the time his mother was ill, and the family physician, Dr. G. Glanville Rusk, suggested that if the boy would like to study medicine, he would take him as his office student, send him to the University until he got his degree, and pay all his expenses. I think, therefore, Dr. Rusk deserves our mention. Young Abbott studied all summer under his generous preceptor, drove the doctor's carriage and did various odd jobs, and in the fall of 1881 entered the University of Maryland School of Medicine from which he graduated in 1884, having decided to spend three years in school instead of

* Read January 6, 1936.
† Unpublished.

the two years in which a man could then complete the medical course. Dr. Abbott graduated second in his class with an average of 98.5, the late Dr. Charles P. Noble, a fellow of this College, being first with 98.8. Again Dr. Rusk had a suggestion to make, this time that the young doctor enroll in a course on pathology about to be offered by a Dr. Councilman at Johns Hopkins University. This Dr. Abbott did, and on its completion Dr. Councilman appointed him as an Assistant without pay. Then Major Sternberg, later the Surgeon General, having a grant to study commercial disinfectants wanted an assistant, and Dr. Councilman recommended that Dr. Abbott accept the position and thus learn something about bacteriology. This position paid $50 a month. As Dr. William H. Welch was soon to return from Europe and had shipped equipment for his laboratory to be opened in the Hospital, Dr. Abbott was kept busy in preparing the laboratory. Dr. Welch arrived, courses were organized, and Dr. Abbott was made an Assistant in Bacteriology. In 1886, Dr. Welch suggested a career in Public Health to the young assistant, and Dr. Abbott, taking his advice, went to von Pettenkofer's laboratory in Munich for a year and a half and spent a winter in Koch's laboratory in Berlin. In 1889, the Johns Hopkins Hospital was about to be opened, and Dr. Hurd, needing a resident Sanitarian in the Hospital, offered Dr. Abbott a room, board and washing and $50 a month. Dr. Welch also had him appointed an Assistant in Bacteriology and Hygiene in the fall of 1889. Then began, judging from the reminiscences, a very happy experience for Dr. Abbott. When Koch announced the discovery of tuberculin as a possible cure and preventive of tuberculosis, Dr. Abbott was sent to Berlin to learn what he could about it. Most of the passengers on the steamer were physicians on the same mission. Berlin newspapers stated that there were in the city five thousand foreign physicians from all over the world. Dr. Abbott had an interview with Koch, got a promise that a supply of tuberculin would be sent to the Johns Hopkins Hospital, saw some cases treated with the new remedy and then returned to Baltimore. His report was published in the *Johns Hopkins Bulletin.* He helped in the early work on malaria, after Laveran's discovery, with Sternberg, Councilman and Osler. In the reminiscences are many references to these wonderful days, friendships with that extraordinary group of men assembled at Johns Hopkins University at the time the

Hospital was built and the Medical School organized. The scientific atmosphere was stimulating. The workers seem to have formed a very happy family. There was good companionship and good cheer. Dr. Abbott as President of the Johns Hopkins Residents Association figured largely in these good times.

In 1890, Dr. Abbott was called to the University of Pennsylvania and was told to go to Europe to purchase equipment for the proposed new Laboratory of Hygiene which was to be erected. He left Johns Hopkins and went abroad. He had met while in Baltimore Miss Georgina Picton Osler, who had left her home in Toronto to keep house for her uncle, Dr. William Osler. The reminiscences tell that while Dr. Abbott was abroad, purchasing supplies for the Hygiene Laboratory, Miss Osler was travelling in Europe, and that they met again over there and became engaged. In Toronto in August, 1892, they were married. Dr. and Mrs. Abbott had three children, a daughter and two sons; one of whom, William Osler Abbott, is a Fellow of this College.

When Dr. Abbot first came to Philadelphia he lived in the Hygiene Laboratory and was first Assistant to Dr. Billings who was Director. In 1896 Dr. Abbott succeeded Dr. Billings as Pepper Professor of Hygiene and Director of the Laboratory of Hygiene, and in 1899 his title was changed to Pepper Professor of Hygiene and Bacteriology. In February, 1912, the University conferred the honorary degree of Doctor of Public Health on him, and that spring the degree of Dr.P.H. was conferred on four physicians who had completed this, the first graduate course in Public Health leading to a degree in this country. This degree was conferred on 34 graduates before Dr. Abbott retired. He had been instrumental in originating this course. This was in addition to his work as Professor of Hygiene and Bacteriology, both of which subjects he taught to the medical students.

Dr. Abbott also, besides his University duties, did much for the city of Philadelphia. In 1897 he became Director of the Laboratory of the Board of Health in City Hall and in 1903 was made Chief of the Bureau of Health of Philadelphia. He resigned as Chief in 1909 but remained on the Board until shortly before his death, being President for some years.

Although he seems to have missed his Johns Hopkins friends and the opportunities he had there to do research and although he felt that the University of Pennsylvania was a rather uncomfortable location for a Johns Hopkins man, which he with some

justice considered himself, he soon made many firm friends in Philadelphia. He refers frequently to the delights of "Reichert's Lunch Club" and a few years ago wrote a very amusing account of it for one of the graduating classes at the University. Dr. Reichert in his laboratory was accustomed to prepare each day luncheon for a small group of his colleagues. The original members were Piersol, Marshall, Flexner and Abbott. Later Smith, Pearce and Taylor were frequent attendants. Dr. Abbott refers to this group as "convives." The dictionary states that a convive is "a boon companion; one who is convivial; a guest at table." He himself certainly qualified for such an appellation.

In 1926 Dr. Abbott, who had attended a Wistar Party at Mr. C. C. Harrison's, was waylaid by a couple of thugs who hit him over the head with a blackjack and robbed him; this on 17th St. between Locust and Walnut. Although he suffered a depressed fracture of the skull from this vicious attack, he recovered completely, thus showing the soundness of his constitution, although this had been evidenced by his activities in the Army during the World War.

In his early days at Johns Hopkins Dr. Abbott had published several papers on such subjects as Asiatic cholera, membranous rhinitis, and diphtheria, one of which was in collaboration with Dr. Wm. H. Welch. His "Principles of Bacteriology" first appeared in 1892 and went through many editions. He published in 1899 another textbook "The Hygiene of Transmissible Diseases, their Causation, Modes of Dissemination and Methods of Prevention."

Dr. Abbott had been commissioned a Lieutenant in the Medical Reserve Corps in 1908 and, with the entrance of the U. S. into the War in 1917, was promoted to Major and ordered to Camp Greenleaf on July 18, 1917. He was at the time fifty-seven years of age. Colonel Page, Commandant of the Camp, was delighted to have Major Abbott assigned to the Camp, on account of his knowledge of hygiene and sanitation. He was soon made Sanitary Officer of the Camp and took a leading part in organizing the Camp Greenleaf School of Military Hygiene, of which he was Director, and he was chosen President of the Greenleaf Medical Society. For a time I "bunked" with him in a small cubicle in one of the barracks and got to know him much better than I probably could have done in any other way. He enjoyed his army life at Camp Greenleaf, I believe, more than any other officer I met. He was

interested, energetic, tireless and always ready for a bit of fun or a harmless practical joke. In September, 1918, he, having tried for some time to get orders for over-seas duty, was finally ordered to Camp Beauregard to command Base Hospital No. 71 then nearly ready to go to France. Through the usual delays his Base Hospital did not embark on a transport until November 10, and it was aboard ship, still at the dock, that he heard the noise of the celebration of the signing of the Armistice on the morning of the eleventh. However, the ship sailed on the 12th, and Dr. Abbott was appointed Surgeon of Troops on the transport. The Base Hospital went to Pau and then to Chartreuse de Vauclaire. Here Dr. Abbott was relieved of his command of the Base Hospital and ordered to Toul to relieve Zinsser, the Sanitary Inspector of the Second Army. In April, 1919, Dr. Abbott was promoted to Colonel and finally got his discharge in May, 1919, upon his return to this country.

Dr. Abbott spent his summers at Waquoit, Mass., on Cape Cod; where he built a house in 1899. In 1910, while indisposed from some slight illness, Mrs. Abbott thinking to amuse him, gave him paint and brushes, and he became at once greatly interested in painting in oils. He had always had a happy facility with pen and pencil and had even drawn illustrations, which were reproduced in published scientific articles. He was for a time Vice-President of the Philadelphia Sketch Club. In recent years, however, his chief amusement was in his garden at Waquoit, studying seed catalogues all winter and working in the garden in the summer time. In the fall of 1933 Dr. Abbott had an attack of dizziness and aphasia, which shortly cleared up, but with the advent of cold weather in the fall of 1934 he had another and more severe attack and was confined to bed with general weakness of his extremities and difficulty in articulation. This lasted six months. This past summer he worked in his garden as usual, but on September 11, a cold day, he carried three heavy logs into the house to build a fire and was found shortly afterwards lying dead on the hearth. Thus at the age of seventy-five years ended a life, filled with interest, accomplishment and many of the things which make life well worth living. He was indeed a boon companion and a convivial spirit, a true "convive." From the time he completed his machinist's apprenticeship until his death, he enjoyed life to the full.

THE ANNUAL ADDRESS OF THE PRESIDENT *

By ALFRED STENGEL, M.D.

In obedience to the Ordinances and By-Laws your President presents a brief annual report which need not touch in detail on any of the activities of the College which have been included in the reports of other Officers or of the Council.

The Stated Scientific Meetings have been held regularly at the appointed times and have been well attended. For this we must give thanks to the Committee on Scientific Business who have sought with diligence to provide programs of general interest and representative of the highest types of modern medical work in practice and research. As in the preceding year the endowed Lectureships were used to furnish the business of the stated meetings, and thus it has been possible to secure for these meetings men of distinction from various parts of this country and from foreign countries.

It has been the policy of the Committee on Scientific Business and of your President to leave to the Sections of the College more or less exclusively the presentation of briefer discussions of matters of current interest, preliminary reports on medical work, etc., without in any way, however, limiting the activities of the Sections. Some effort has been made to prevent duplication between the Sections and the College, and it is hoped that during the coming year even closer cooperation may be established between the several program committees. Medical meetings have multiplied so greatly that the College should bend every effort toward presenting the highest type of medical addresses. Otherwise the meetings here would lack the distinction worthy of the College.

It is appropriate to note the fact that during the year a number of notable additions have been made to the Library's collection of rare books. For these the "Friends of the Library" and Dr. Charles W. Burr deserve particular mention.

The affairs of the Library have been conducted with great wisdom by the Library Committee, and the growing number of

* Read January 6, 1936.

readers attests the satisfaction given them by the arrangements of the Library and by its attendants. It is an agreeable duty to mention particularly the work of our Librarian and his brilliant interpretation of important acquisitions as well as of some of the older works on our shelves. With a return of more opulent days, it may be hoped that a considerable extension of this branch of the Library's functions may be made possible. It is plainly one of the duties of this College through its scientific meetings and the activities of its Library to stimulate medical scholarship of the highest type.

The financial situation of the College, though far from what it should be, is at least for the present satisfactory, as the budget is practically balanced, and further invasion of capital funds will be avoided. It is, however, regrettable that to attain this secure position it has been necessary to reduce salaries and wages and curtail in some other directions.

The number of proposals for new Fellowships indicates how keenly election to membership in the College is appreciated. The Council has sought to inform itself fully as to the qualifications of those proposed and hopes for full cooperation of the Fellows, from whom they must expect expressions of opinion. It should be called to the attention of our own members, some of whom apparently are unfamiliar with our By-Laws, that proposals for Fellowship must come from Fellows, and that there should be nothing in the nature of application on the part of individuals desiring election. Sometimes such aspirants have obtained proposal blanks and have personally sought for proposers and seconders. This of course should not be, and if Fellows who propose candidates allow the latter to take the blanks to others to be seconded, the result must be to excite prejudice against the candidates whom they are proposing.

It is the sad duty of the President to call attention to a considerable number of deaths of Fellows from December 1934 to December 1935. There were the following:

Dr. A. F. Kempton, died December 6, 1934, elected March, 1898.

Dr. C. Carl Huber, died December 26, 1934, elected 1912 (Non-Resident).

Dr. G. Morley Marshall, died January 8, 1935, elected 1898.

Dr. Edmund B. Piper, died January 14, 1935, elected June, 1917.

Dr. Thomas C. Stellwagen, died March 15, 1935, elected Oct. 1910.

Dr. Fielding Garrison, Honorary Member, died April, 18, 1935, elected 1931.

Dr. Delno E. Kercher, died May 6, 1935, elected April, 1905.

Dr. William J. Merrill, died May 10, 1935, elected November, 1914.

Dr. Charles A. Fife, died June 15, 1935, elected February, 1907.

Dr. Thomas McCrae, died June 30, 1935, elected January, 1913.

Dr. Barton Cooke Hirst, died September 2, 1935, elected May, 1888.

Dr. Alexander C. Abbott, died September 11, 1935, elected April, 1892.

Dr. John R. Forst, died November 1, 1935, elected October, 1916.

Dr. Charles T. Noble, died November 21, 1935, elected November, 1889.

It would be ungracious of the President if he failed to express his gratification for the splendid support of the Officers, Council, and Committees and his appreciation for the honor the College has bestowed on him by his continuance as President.

ANNUAL REPORT OF THE LIBRARY COMMITTEE FOR 1935

Mr. President: In accordance with the Ordinances and By-Laws of the College, I herewith submit the following report of the Library Committee for the year 1935:

The library has felt the pinch of the times more acutely in the past year than in the years immediately preceding. Several sources of our income have suffered unavoidable casualties. The cost of foreign scientific periodicals, despite a certain measure of relief obtained largely through the activities of the Medical Library Association, remains in many cases unreasonably high. The result has been that the maintenance of our periodicals has consumed almost all our funds. The evening openings were reluctantly reduced from two to one a week, the summer closing lengthened—the latter as partial compensation to the staff for a further reduction in their salaries.

Though one hundred and twenty-three fewer books were accessioned this year than last, the number of bound periodicals increased by 382, making this year's total of accessions 259 more than that of last year. More than half of this total, it may be noted, represents material received by gift or in exchange, whereas in the preceding year the percentage was appreciably less. The increase in the total of all items in the library will be seen to be greater than that of last year.

Since the mettle of a modern working library is to a certain extent tested by the use made of it, there is a measure of disappointment in the slight decrease in the number of visitors. This decrease, however, is perhaps more apparent than real. The number of visitors would doubtless have at least equalled that of last year but for the dropping of the Friday evening openings, and the longer summer closing. An encouraging increase in the number of Fellows using the library may be noted. We may properly not anticipate for the immediate future any decided increase in the number of visitors. The general public has never figured largely among them. The new Library Rule which limits the number of cards entitling visitors to withdraw books may be

expected to have a restrictive effect on the number of visitors, though such was not its purpose. In addition, the growing libraries of the various medical schools, and that of the County Medical Society, probably will tend in time to absorb many of our more casual readers, without at all impairing this library's unique position in the city. It is, therefore, to the maintenance and development of the features of the library which will not and cannot be duplicated elsewhere in the city that we believe the efforts of the Fellows and friends of the College ought chiefly to be directed.

In short, though the following statistics show appreciable gains in a number of instances, the Library Committee believes that they will be read most fruitfully by placing emphasis upon the distance from Utopia, rather than upon whatever measure of accomplishment they may suggest.

Inventory

		1935	1934
Total number of volumes in the Library		176,492	174,822
Incunabula	409		
Manuscripts	502		
Other Bound Volumes	142,886		
Unbound Reports and Transactions	25,088		
Unbound Periodical "Reserves"	4,533		
Unbound volumes more or less incomplete	3,074		
	176,492		
Other unbound material		259,233	245,655
Pamphlets (less than 100 pages)	226,377		
Theses and Dissertations	32,856		
	259,233		
Duplicates		10,202	10,076
Portraits		30,998	29,385
Total of all items in the Library		476,925	459,938

Distribution of This Material

	Bound	Unbound	Total
General Library	149,806	322,922	472,728
On permanent deposit:			
Gross Library	3,783	4	3,787
Library of the Obstetrical Society of Philadelphia	217	0	217
Mütter Museum *	193	0	193
Total (including duplicates)	153,999	322,926	476,925

* The books of the Mütter Museum are not permitted to be removed from the College building.

Current Periodicals

The current-periodicals department is at present in process of reorganization. Under-staffed as the department has been, and is, it has suffered further in various ways. The present reorganization is expected to place the department on a firmer basis of fact, however deflationary the process.

The titles listed as current number 1101 (563, by purchase; 538, gratis or in exchange). This does not include 167 of the 1353 titles listed as current in 1934, of which no issues were received in the past year. Twelve new titles were added during the year: 7 by purchase, 5 gratis or in exchange. Two periodicals which had formerly been purchased were added to the list of exchanges. The total number of issues received was 20,432, including dupicates and the claims mentioned below. The following tabulation lists the periodicals by country of origin:

	Purchase	Exchange or Gratis	Total
1. American	121	281	402
2. Belgian	5	7	12
3. British	69	43	112
4. Canadian	2	11	13
5. Chinese	1	4	5
6. Cuban and Porto Rican	0	12	12
7. Danish	6	1	7
8. Dutch	4	2	6
9. French	103	22	125
10. German and Austrian	164	6	170
11. Indian	2	11	13
12. Italian	59	24	83
13. Japanese	5	16	21
14. Mexican	0	7	7
15. Philippine	1	3	4
16. Russian	0	7	7
17. South American	5	44	49
18. Spanish	4	16	20
19. Swedish and Norwegian	6	7	13
20. Swiss	5	0	5
21. Miscellaneous (less than 3 each: Algerian, Czech, Egyptian, etc.)	1	14	15
Totals 1935	563	538	1,101
1934	694	659	1,353

The work of binding had been retarded of recent years by a large number of missing issues for which claims had not been sent. We were fortunate in being able to acquire the services of a medical student on government aid who was put to the task of assembling the data and sending the claims. Considering the length of time which elapsed between the time when the claims might properly have been sent and that when they were sent, the response was highly gratifying. Of the 488 volumes which were incomplete, involving 246 titles, 247 volumes, involving 176 titles, were completed. Forty of the titles, involving 84 volumes, were no longer being published.

Readers' Use of the Library

Number of readers:

	Visitors		Fellows		Total	
	1935	*1934*	*1935*	*1934*	*1935*	*1934*
Day	8,122	8,340	2,085	1,824	10,207	10,164
Evenings (59)	975	1,393	173	169	1,148	1,562
Legal Holidays (2)	57	145	9	23	66	228
	9,154	9,878	2,267	2,016	11,421	11,894

Circulation of books:

	1935	*1934*
Number of volumes taken out	8,966	8,298
Number of volumes consulted in the Library	46,357	47,134

The number of books "consulted in the Library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and works of reference kept on the shelves in the Reading Room, and the Fellows of the College have access to the book stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

It is a matter of regret that the Library was forced to diminish the number of hours in which it was open. This has had a natural effect on the year's total of visitors. With the return to better times which, at the moment, seem less distant, the Library may be expected to expand its activities again as far as its circumstances will permit.

Inter-library Loans:

The Library has sent bound volumes on inter-library loan to eight states in the Union and borrowed on the same terms from four. Furthermore, a number of our non-resident Fellows living within the state have found it both practical and advantageous to have material sent to them from the Library from time to time.

Use of the Study Rooms:

Average number of rooms in use throughout the year, 9. (1934: 7.)

Number of volumes used in these rooms during the year, 941. (1934: 1,823.)

The use of the study rooms increases more slowly than the new terms of their use by Fellows would seem to invite. Two of the rooms unfortunately have had to be relinquished for economic and other reasons by the groups occupying them.

With the purpose of encouraging our medical students' use of, and pleasure in, books, the Library has recently inaugurated a Students' Room in which the students may find at arm's reach, not only books useful to their immediate studies, but the recent books of medical history and biography, and others of para-medical interest.

Photostats:

850 prints have been furnished to Fellows; 936 prints to others than Fellows; 1,305 prints to the Library. The latter include 2 volumes of incunabula (bringing the total of photostated incunabula to 308), portraits, copies of rare books on loan, etc.

Complete photostatic copies of two of our rarer incunabula have been furnished at cost to one of the leading medical libraries, and the Committee is anxious that knowledge of this means of acquiring copies of our incunabula be disseminated as widely as possible.

Acquisitions and Accessions

During the year there were received from all sources 2,217 volumes (including 212 unbound Reports and 248 duplicates); 10,917 pamphlets; 5,800 Theses and Dissertations; 20,432 numbers of various periodicals.

Unbound material and duplicates are not accessioned. The accessions number 1,757 volumes; Books, 727; Periodicals, 1,030 (by purchase, 869 volumes; by gift, 614 volumes; by exchange, 274 volumes).

Donations. The individual donors for the past year, ending November 1, 1935, number 238.

The Library is indebted for large gifts of books, pamphlets and unbound periodicals to the following donors: Dr. F. H. Adler, Dr. H. B. Allyn, Mrs. A. P. C. Ashhurst, Biological Abstracts, P. Blakiston's Son & Co., Dr. C. W. Burr, Dr. B. Chance, Mrs. F. X. Dercum, Dr. J. Diven, Dr. A. A. Eshner, Dr. J. P. C. Griffith, Dr. B. C. Hirst, Paul B. Hoeber, Inc., F. Krauss, Dr. E. B. Krumbhaar, Lea and Febiger, Dr. F. H. Leavitt, J. B. Lippincott Co., Medical Library Association (in exchange), Dr. C. F. Mitchell, Mr. A. B. Randall, Dr. D. Riesman, W. B. Saunders Co., Dr. G. E. de Schweinitz, Dr. W. J. Taylor, Dr. J. Walsh, Dr. M. P. Warmuth, Dr. T. S. Weisenburg, Dr. P. F. Williams, Mrs. J. C. Wilson, Dr. W. Zentmayer, Mrs. S. L. Ziegler.

Various publishing houses have presented volumes as follows: P. Blakiston's Sons & Co., 6; F. A. Davis Co., 14; Lea and Febiger, 18; J. B. Lippincott Co., 12; W. B. Saunders Co., 36.

One hundred and thirty-two volumes were presented by the following authors or editors: E. Abderhalden, I. Abrahamson, M. S. Adolf, J. B. Amberson, Jr., G. E. Anderson, B. K. Ashford, J. H. Bargen, S. W. Becker, M. Bently, A. A. Berg, H. I. Berg, C. E. Blanchard, C. S. Bluemel, S. W. Boorstein, M. Braude, F. Brush, B. W. Burhoe, R. C. Cabot, C. M. Campbell, R. Chambers, C. O. Cheney, L. B. Chenoweth, J. Y. Clark, W. I. Clark, L. Clendening, M. M. Cloud, E. Cole, E. Conus, C. B. Davenport, M. B. de Jarnette, W. A. Dewey, R. Dodson, G. H. Donahue, G. Draper, L. C. Dunn, F. C. Ewing, I. E. Fancher, M. O. Foley, H. P. de Forest, F. S. Freeman, J. F. Fulton, J. E. Goldthwaite, M. A. Goldzieher, J. P. Greenhill, J. M. Grimes, H. W. Haggard, H. O. Halvorson, A. Hamilton, R. L. Hapgood, G. H. Hartmann, Y. Henderson, C. H. Henniger, A. E. Hertzler, J. H. Hess, L. E. Himler, F. Hinman, I. S. Hirsch, F. G. Holmes, H. N. Holmes, W. F. Hooper, S. Howard, R. Hughes, R. H. Hutchings, E. Johns, H. A. Jones, L. Kanner, C. U. A. Kappers, L. C. Kellogg, O. A. Kenyon, S. Kingsley, N. Kopeloff, J. F. Landon, T. H. Larson, S. K. Lesser, M. Liotta, E. P. Lovejoy, T. McCrae, C. C. Maher, R. H. Major, W. Malamud, J. W. Maliniak, B. Malzberg, E. Mellanby, C. J. Miller, C. A. Mills, A. Moldavan, R. T. Morris, A. Niemoeller, K. Ogino, J. J. A. O'Reilly, H. E. B. Pardee, A. V. Partipilo, R. Pemberton, S. Peskind, T. R. Ponton, W. A. Pusey, W. D. Reid, L. F. Rettger, D. Riesman, E. Robb, H. Rohleder, C. W. G. Rohrer, W. H. C. Romanis, A. H. Ruggles, J. Safian, L. Sante, K. Singer, Sister Mary Victor, H. F. Smythe, Jr., W. Spiers, R. P. Strong, E. J. Stieglitz, M. Thorek, W. W. C. Topley, J. M. Vaughn, M. G. Waksmundzka, C. L. Weathers, P. Weber, T. Weisenburg, I. S. Wile, F. N. Wilson, E. Witchen, E. T. Withington, A. Worcester, C. S. Wright, I. M. Yonan, G. Zilboorg, E. E. Ziegler, H. Zinsser.

Five volumes were sent by the publishers at the request of the following authors or editors: A. S. Blumgarten, G. Cameron, L. Levin, C. B. Rabin, V. Sheean.

Exchanges

349 copies of the Transactions were sent as gifts or in exchange for 294 publications of other organizations.

We have not distributed books or journals on exchange account through the Medical Library Association. The Library has, however, received thirty-six such distributions, which aided materially the constant effort to complete our files.

5,800 Theses and Dissertations have been received from the following European Schools of Medicine with which we exchange publications at the present time: Universities of Amsterdam, Basel, Berlin, Bonn, Breslau, Erlangen, Giessen, Göttingen, Heidelberg, Kiel, Köln, Königsberg, Lausanne, Leiden, Leipzig, Liège, Lund, Marburg, Oslo, Paris, Rostock, Tartu, Würzburg.

Work of the Cataloguers

Number of works classified, shelf-listed, and for which cards were filed	687
Cards typewritten, examined, and filed	5,874
Library of Congress cards and other cards altered and filed	6,408
Pamphlets and reprints subject-headed and arranged alphabetically by subject, and by author under the subject	2,183

The Cataloguers have carried on the preparation of indexes of early presses, printers' devices, and first editions, and have commenced an index of artists and illustrators. They have continued the work of reclassifying and alphabetizing the large number of loose portraits, certificates, diplomas, etc. And several gifts of autograph collections have required the cataloguing of those autographs which were not in our collection.

Activities

Exhibits. Four of the year's exhibits attracted rather more than the usual attention. One (in two parts) presented a selection of books listed in the first manuscript catalogue of the Library, compiled in 1818, and served to illustrate the Library's early devotion to the *rariora* of medical literature. (The books in the first part of this exhibit were recorded in an appendix to the *Booklist* of November 15th–December 15th, 1934.) An exhibit on Colonial Medicine and another of medical autographs aroused considerable interest, the latter leading to gifts from Drs. W. J. Taylor, Alfred Hand, and E. B. Krumbhaar of several interesting and valuable autographs. The survey of our incunabula was concluded, several other large exhibits were given, and the Section on Medical History had at each of its meetings a display of material pertinent to the subjects discussed.

A new medal case was appropriately inaugurated, at the time of the Anniversary Dinner in December, with a display of medical medals, medallions, and plaques which were the work and the gift of a Fellow of the College, Dr. R. Tait McKenzie, the distinguished sculptor and physician. The new case was designed to house the College's complete collection of medals, and is commodious enough to take care of additions for some time to come.

Fugitive Leaves. With the second issue of the 1935 series, the *Booklist* appeared for the first time in mimeographed form. The same issue signalized the appearance of the first of the *Fugi-*

tive Leaves, a section devoted to the publication of unusual material in the Library, or of information concerning it. The *Fugitive Leaves* have thus far given first publication to a letter of Benjamin Rush to John Morgan, and to a translation (by the Librarian) of a supposed incunable in the College collection, with notes on its author, its text, and its incunabular qualifications. Future issues will present, among other things, a revision, with annotations, of the catalogue of our incunabula. In addition to the *Fugitive Leaves,* the new *Booklist* now presents with each issue a page devoted to comment on the recent acquisitions of special interest.

The Librarian addressed two local medical societies during the year on subjects which called upon the resources of the Library for illustration, and spoke before the Section on Medical History; served on the Program Committee of the Medical Library Association and on the Committee for a Union Library Catalogue; prepared an exhibit on medical history for the Philadelphia on Parade Week; contributed an article and several book reviews to various journals, and assisted Dr. George E. de Schweinitz in the preparation of the revised edition of the latter's "Account of the College of Physicians."

SUMMARY OF EXPENDITURES FROM THE FUNDS

Endowed Library Funds	
Henrietta Rush Fales Baker Fund	$ 224.20
Luther S. Bent Fund	38.85
William T. Carter Fund	00.00
Gerardus Clarkson Fund	39.59
Francis X. Dercum Fund	247.57
Louis A. Duhring Book Fund	315.12
Augustus A. Eshner Fund	400.02
John D. Griscom Fund	342.27
Richard H. Harte Fund	269.98
Charles T. Hunter Fund	17.68
William F. Jenks Fund	346.90
Oliver A. Judson Fund	42.94
William V. and John M. Keating Fund	61.44
William W. Keen Fund	222.23
Library Endowment Fund	595.59
Horace Magee Memorial Fund	737.35
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Caspar Wistar Fund	172.76
S. Lewis Ziegler Fund	248.70
From the General Account	17,459.72
From Special Accounts:	
Friends of the Library	415.52
Fund for rare and valuable books	13.41
Fund for completing files of journals	00.00
Henry Leffman Trust	260.53
Photostat Fund	137.82
Special Fund for Binding Dissertations	00.00
George B. Wood Fund	322.75
Expenditures from the Duhring Library Fund	Included in the General Account
Expenditures from the Morris Longstreth Fund	Included in the General Account
Binding: 737 volumes have been bound	$ 1,062.50
Sale of Duplicates: amounted to	161.80
Fines: amounted to	192.00

Acquisitions of Incunabula and Other Works of Special Interest

Beginning with the *Booklist* printed in November of 1934, it has been our custom to mention therein certain of the recent acquisitions of *rariora*. The titles of the books so mentioned will be found in the following list; comment on the books in this list has, naturally, been restricted to those not previously mentioned.

Where the name of a donor is not specified, it may be assumed that the book was purchased from the Library's Fund for Rare Books. A single asterisk signifies that the edition, a double asterisk that the title, is not listed in the Index Catalogue.

Incunabula

**Brunschwig, H. Chirurgia. Strassburg, J. Grüninger, 1497. [See: Booklist, Nov., 1934.]
Gift of the Friends of the Library and the Fund for Rare Books.

**Eusebius, P. Historia ecclesiastica. Mantua, J. Schallus, 1479. [See: Booklist, 1935, no. 3.]
Gift of Charles W. Burr, M.D.

Jacobus de Forlivio. Expositio super aphorismos Hippocratis. Venice, B. Locatellus, 1495. [See: Booklist, 1935, no. 3.]
Gift of Charles W. Burr, M.D.

Other Works

Barwell, R. On the cure of the club-foot without cutting tendons***. 2d. ed. London, Hardwicke, 1865.

Gift of the late A. P. C. Ashhurst, M.D.

Autographs of Thomas Hewson Bache, John Ashhurst, Jr., and Astley P. C. Ashhurst.

Brucker, J. Ehren-tempel der Deutschen Gelehrsamkeit*. Augsburg, Haid, 1747.

Among the learned medicos having niches in this temple will be found Gesner, Adolf Occon, Janus Cornarius, A. P. Gasser, and others. Not the least valuable feature of the book is the finely executed portraits, the work of the publisher, who was also a painter and engraver.

Chambers, R. The Thomsonian practice of medicine. Bethania, Pa., [Chambers], 1842.

Gift of the Library of Haverford College.

The fanatical admiration which the Thomsonian work won in certain quarters is exemplified by this Pennsylvania disciple, who, in his preface, declares that it is "without doubt, the best work extant, concerning the subject of medicine, and the methods of curing every curable form of disease."

Cooper, A. and Travers, B. Surgical essays. 3rd ed. (cop. 2) London, 1818.

Gift of Herman B. Allyn, M.D.

Bookplate of Dr. [John] Butter (1791–1877), the British ophthalmologist.

*Culpeper, N. The complete herbal***. A new edition. London, Virtue, [n.d.].

Gift of Charles W. Burr, M.D.

A rare 19th century edition of the famous *English Physician Enlarged*, notable for its fine colored plates, typography and binding, a product of the celebrated art publishing house of Virtue and Company.

*Curtis, J. H. A treatise on the physiology and pathology of the ear. 5th ed. London, Longmans, 1831.

Gift of the Friends Free Library of Germantown.

*Delacroix, [J.–F.] Manuel des hemorroïdaires. 4th ed. Paris, Chez l'auteur, 1829.

A monograph by a fashionable Parisian doctor, sometime member of the Faculté de Paris, with connections at various hospitals, such as Hôtel-Dieu. The verso of the half-title page contains the autograph of the author (as mark of the genuine edition), with a statement of his address and office hours.

Fabre, [Pierre]. Traité des maladies vénériennes. 4th ed. Paris, P. Fr. Didot le jeune, 1872.

Gift of the late A. P. C. Ashhurst, M.D.

This copy, compared with the imperfect one in our Gross collection, reveals an interesting situation between the famous houses of Didot and Barrois, neighbors on the Quai des Augustins. Pierre François Didot, junior, and Théophile Barrois, junior, each issued a "fourth edition" under his own imprint, in the same year. The same plates seem to have been used for the body of the texts. Title-pages, ornamentation, occasional headings, differ. Didot's title-page, proclaiming him bookseller-printer to Monsieur (later Louis XVIII), claims also for the book the approval and privilege of the King. Barrois claims no such distinctions. Our Didot copy has two further affiliations with the house of Barrois: (1) eight pages of announcement of their wares, printed at least eight years after the book, and inserted between preliminary fly-leaves; (2) bound with the "Traité," Barrois' 1786 edition of Fabre's "Lettres à M.D.***" Both are, curiously enough, lacking in the Barrois edition of the "Traité." The Index Catalogue lists a "fourth edition" (Didot) as of 1795—from which we may infer either an error in transscribing the date, or a reissue (P. Fr. Didot died in the latter year).

Foot, J. A critical inquiry into the ancient and modern manner of treating the diseases of the urethra. 4th ed. London, Becket, 1786.

Gift of Alexander Randall, M.D.

A work of the obstreperous Foot which, somewhat surprisingly, was not hitherto on our shelves.

*Gleize. Nouvelles observations pratiques sur les maladies de l'oeil et leur traitement. 2d ed. Orleans, Guyot, 1812.

M. Gleize was a popular 18th century ophthalmic surgeon of Orleans. Below his portrait on the frontispiece we read that "by his success he compelled a desire to render homage to his dexterity, while showing himself, by his humanity, worthy of uniting the virtues to genius." A curious book, revealing the author as an amiable, well-read, sensible man —and something of a poet. There are, for instance, "Verses on the operation for Cataract," and others in homage to Hippocrates and the physicians of antiquity. At the close of his somewhat autobiographical introduction, there is expressed the wish that his son, now following with honor, "in Charlestown, a city of North America," a career similar to his own, might return to aid him in the work of his old age. There are plates of the eye and of instruments of ophthalmic surgery, and, at the end, several memoirs on allied subjects.

Guipon, J.-J. De la maladie charbonneuse de l'homme. Paris, Baillière, 1867.

In exchange.

Hernandez, F. Rerum medicarum Novae Hispaniae thesaurus seu Plantarum animalium mineralium Mexicanorum historia. Rome, Mascardi, 1651. [See: Booklist, 1935, no. 5 (October).]

Gift of Charles W. Burr, M.D.

Jackson, J., sr. Letters to a young physician just entering upon practice. 4th ed. Boston, Phillips, 1856.

Gift of Joseph Walsh, M.D.

First published in 1855, these "letters," embodying the mature observations of the distinguished Boston physician, have become a classic in their kind.

Moquin-Tandon, C.–H.–B.–A. Éléments de botanique médicale, 2d ed. Paris, Baillière, 1866.

Gift of Mrs. E. A. Calves.

The "Elements of medical zoölogy" of this esteemed botanist and zoölogist was acquired by the Library many years ago; the work on medical botany finds its place on the shelves only now.

*della Porta, G. B. Natural magick: in XX bookes. [London, Young, 1658.] [See: Booklist, 1935, no. 4 (September).]

Gift of Charles W. Burr, M.D.

Robertson, R. Observations on jail, hospital, or ship fever. A new edition. London, the author, 1789.

Gift of Francis R. Packard, M.D.

Welcomed as a second copy, the first being restricted to the Gross Library.

**Schröter, W. D. Kurtze Verfassung wie . . . sich jedermänniglich vor und bei einschleichender Seuche der . . . Pestilentz heilsamlich verwahren. . . . Saalfeldt, Kittern, 1680.

A 17th century tract which, compared with our earlier plague tracts, reveals interesting changes of emphasis, and new developments, in the treatment of plague. Schröter was apparently of Leipzig, probably not himself a physician, since he claims no such distinction. The work is based, he says, on various ordinances which he has noted and on the plague-counsels of famous medicos, particularly those of Leipzig. It closes with three "experiments superior over all others"; (1) a preservation (wormwood, rue, myrrh, etc.) which saved thousands in Venice during the plague of 1534; (2) a curative (water of wormwood, malmsey or the best Spanish Wine, Venetian Theriac, etc.) brought to London in 1666 by Captain Willsis (?); (3) a plague-vinegar with which a famous medico successfully kept himself and many hundreds of others safe in the midst of a severe plague. "Adjeu."

*Small, E. A treatise on inflammatory diseases of the uterus, and its appendages. Boston, Mussey, 1853.

Gift of Samuel X. Radbill, M.D.

Written expressly, says the author, for the instruction and benefit of Females, the little book is dedicated more restrictively "To the Ladies of New England." The doctor appends his address and office hours, with the information that he can be consulted by letter (post-paid), and that all consultants may be assured of the utmost sympathy and moral delicacy in the investigation of their case.

Tarin, P. Adversaria anatomica, de omnibus corporis humani partium, tum descriptionibus, cum picturis. Adversaria anatomica prima, de omnibus cerebri, nervorum et organorum functionibus animalibus inservientium, descriptionibus et iconismis. Paris, Moreau, 1750.

Gift of Francis C. Grant, M.D.

This renowned Frenchman produced a number of estimable works on anatomy and physiology, of which the above is the first to find its way into this library. The colored copperplates, produced by a pupil of Le Blon, are among the earliest employed in anatomic illustration.

The town and country friend and physician. Philadelphia, Humphreys, 1883.

Gift of George M. Dorrance, M.D.

The first part is frankly taken from Parkinson's "The villager's friend and physician"; the second is probably Humphreys' own pastiche of various medical writers. There is discrimination and sound sense, however, in the selection, reminding us that the publisher had taken first steps toward a medical career before turning to printing.

Le triumphe de haulte et puissante Dame Vérolle et le pourpoint fermant à boutons. Paris, Willem, 1874. [See: Booklist, 1934, no. 4 (Sept.)]

Gift of the Friends of the Library.

Valescus de Tarenta. Philonium, seu Practica medicinae. Lyons, Jac. Myt for S. de Gabiano, 1535.

This edition contains, in fact, all the medical works of Valescus, since in addition to the "Practica" we find herein the treatises on surgery and the plague. There is appended, also, Tornamira's "Libellus Introductorius," based on Galen. Two of the incunabula editions of the treatise on the plague are in our collection, none of the incunabula editions of the "Philonium."

Vidius, V. De anatome corporis humani. Venice, Junta, 1611. [See: Booklist, 1935, no. 4 (Sept.)]

Gift of the Friends of the Library.

Wagner, C. W. U. Commentatio de coremorphosi sistens brevem methodorum ad pupillae artificialis conformationem hucusque adhibitarum adumbrationem, novique ad iridodialysin instrumenti descriptionem. Göttingen, Viewèg, 1818.

A valuable historical commentary on the methods in use for the formation of artificial pupil. Cited, are Langenbeck, Graefe (C. F.), and other notable contemporary and earlier ophthalmic surgeons. An instrument devised by the author for iridodialysis is described and pictured.

The water-cure journal, and herald of reforms. Devoted to physiology, hydropathy, and the laws of life. New York City. Volumes XI–XVI. (1851–1853.)

Gift of William N. Bradley, M.D.

Our earliest numbers of a journal which progressed through many mutations. Published by Fowlers and Wells, with the above as its first title, it gives an unparalleled picture of the course of hydropathy in its early days in this country, the contributors including the pioneers, Nichols, Chew, and Trall, among others.

Wiseman, R. Several chirurgical treatises. 2nd ed. London, Royston, 1686.

Gift of Francis C. Grant, M.D.

Willis, T. Opera omnia. Venice, Ruinetti, 1708.

Gift of Francis C. Grant, M.D.

The esteem in which Willis' work was held may be gauged by the fact that in the 17th and 18th centuries there were at least ten editions of his collected works. Of these the Library now has five. Both this volume and the preceding one succeed in making more complete our collections of the work of these outstanding 17th century British physicians.

Manuscripts

Ashhurst, J., jr. Journal, September 9, 1848–July 2, 1849.

Gift of Mrs. A. P. C. Ashhurst.

"Friday February 9th, 1849. Having come across the following sentence I thought it appropriate to write, 'I write this having reached my ninth year' [the original quotation is given in Greek]. We had a play with the snow in the afternoon. Richard has had a great deal of interest in the 'prize fight' between 'Hyer' and 'Sullivan,' Hyer beat and is now in prison." "Monday, April 2nd, 1849. . . . After we had finished our Xenophon, I played the piano, while Richard wrote his exercise; We then played with our soldiers."

Dorsey, J. S. Notes on his lectures, taken by Dr. J. Y. Clark. Philadelphia, 1817. [See: Booklist, 1935, no. 5 (October).]

Gift of Alfred Stengel, M.D.

Radbill, S. X. John Eberle, a Pennsylvania Dutch pioneer in American medical education. Philadelphia, 1935.

Gift of the author.

The author's typewritten copy of a paper which is to be published shortly.

Rush, B. Lectures on medicine. Philadelphia, c. 1800. [See: Booklist, 1935, no. 3.]

Gift of G. E. de Schweinitz, M.D.

Student notes, similar to the Dorsey-Clark, above.

Miscellaneous

The Library is indebted to the following for various much appreciated gifts of autographs, photographs, and other memorabilia: *Drs. B. Chance, C. B. Farr, Alfred Hand, E. B. Krumbhaar, Stuart Mudd, William Pepper, W. J. Taylor.*

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LIST OF PRESIDENTS OF THE COLLEGE, LECTURES AND PRIZES

(Supplement to lists in Transactions, 1932, 3s, LIV, pp. vii, lxi)

PRESIDENTS OF THE COLLEGE

1931–33 FRANCIS R. PACKARD
1934–35 ALFRED STENGEL

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA

1932	Not awarded	
1933	Harry Shay, M.D., and J. Gershon-Cohen, M.D.	Philadelphia
1934	Ernst Gellhorn, M.D.	Chicago
1935	Not awarded	

NATHAN LEWIS HATFIELD PRIZE AND LECTURESHIP

1933	XII	Dr. Arturo Castiglioni	Padua
1935	XIII	(a) Michael Heidelberger, Ph.D.	New York
		(b) William H. Park, M.D.	New York

MARY SCOTT NEWBOLD LECTURES

March 23,	1933	XXIX	Burton J. Lee, M.D.	New York
May 3, 5,	1933	XXX	Ronald T. Grant, M.D., M.R.C.P.	London (Eng.)
Oct. 4,	1933	XXXI	Sir Andrew MacPhail, Kt., B.A., LL.D., M.R.C.S., O.B.E.	Montreal
April 4,	1934	XXXII	John B. Flick, M.D.	Philadelphia
Nov. 7,	1934	XXXIII	Walter B. Cannon, M.D.	Boston
May 1,	1935	XXXIV	C. U. Ariëns Kappers, M.D., Sc.D.	Amsterdam
Oct. 2,	1935	XXXV	C. N. H. Long, M.D., Sc.D.	Philadelphia

MÜTTER LECTURES

1933	Arthur B. Duel, M.D.	New York
1934	Charles H. Frazier, M.D.	Philadelphia
1935	Harris P. Mosher, M.D., Sc.D.	Boston

WEIR MITCHELL ORATION

1934	S. W. Ranson, Ph.D., M.D.	Chicago

JAMES M. ANDERS FUND LECTURE

1934	Wade H. Brown, M.D.	New York
1935	John L. Rice, M.D.	New York

FELLOWS

JANUARY, 1936

* For degrees and titles see TRANS., 1932, LIV., xi.
‡ For degrees and titles see TRANS., 1933, I., No. 1, x.
† For degrees and titles see TRANS., 1934, II, No. 3, liii.

ELECTED

1934. DR. WILLIAM OSLER ABBOTT, University Hospital, 36th and Spruce Sts., Phila.†

1912. DR. WILLIAM H. F. ADDISON, Med. Laboratories, University of Pennsylvania, Phila.*

1926. DR. FRANCIS HEED ADLER, 313 S. 17th St., Phila.†

1914. DR. THOMAS G. AIKEN, Berwyn, Pa.*

1936. DR. FRED CUTLER ALDRIDGE, A.B., M.D., Physician, Outpatient Department, Bryn Mawr Hospital. Wayne, Pa.

1936. DR. FAY KNIGHT ALEXANDER, B.S., B.M., M.D., Radiologist, Chestnut Hill Hospital. 8835 Germantown Ave., Phila.

1906. DR. FRANCIS OLCOTT ALLEN, JR., 2216 Walnut St., Phila.*

1932. DR. FREDERICK H. ALLEN, 1711 Fitzwater St., Phila.*

1896. DR. HERMAN B. ALLYN, 3910 Chestnut St., Phila.*

1935. DR. BERNARD J. ALPERS, M.D., Sc.D. (med.), Assistant Professor of Neurology, Graduate School of Medicine, U. of P.; Neuropathologist, Laboratory of Neuro-Surgery, University Hospital; Neurologist, Phila. General Hospital; Neurologist and Neuropathologist, Penna. Hospital. 3400 Spruce St., Phila.

1933. DR. ROBERT S. ALSTON, 121 Walnut Lane, Phila.‡

1888. DR. JAMES M. ANDERS, 250 S. 17th St., Phila.*

1905. DR. BROOKE M. ANSPACH, 1827 Spruce St., Phila.*

1930. DR. KENNETH E. APPEL, Haverford, Pa.*

1905. DR. L. F. APPLEMAN, 308 S. 16th St., Phila.*

1935. DR. GEORGE L. ARMITAGE, M.D., Attending Surgeon, Chester Hospital; Consulting Surgeon, Elwyn School for Feeble Minded. 400 E. 13th St., Chester, Pa.

1922. DR. JOHN H. ARNETT, 2116 Pine St., Phila.*

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1935. DR. JOHN L. ATLEE, M.D., Lancaster, Pa.

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1914. Dr. J. Harold Austin, Maloney Clinic, Univ. Pa., Phila.*
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1935. Dr. Theodore F. Bach, A.B., M.D., Instructor in Medicine, Graduate School of Medicine, U. of P.; Assistant Visiting Physician, Abington Memorial Hospital. 1900 Rittenhouse Sq., Phila.
1910. Dr. Benjamin F. Baer, Jr., 1927 Spruce St., Phila.*
1916. Dr. Percival L. Balentine, 407 Weightman Bldg., 1524 Chestnut St., Phila.*
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1933. Dr. John T. Bauer, Pennsylvania Hospital, Phila.‡
1922. Dr. Henry C. Bazett, Haverford, Pa.*
1908. Dr. E. J. G. Beardsley, 1919 Spruce St., Phila.*
1930. Dr. Joseph T. Beardwood, Jr., Suite 402, 2031 Locust St., Phila.†
1935. Dr. Herman Beerman, A.B., M.D., Senior Instructor, Dept. of Dermatology and Syphilology, Abbott Fellow in Chemotherapeutic Research, Dept. of Dermatology, U. of P. 255 S. 17th St., Phila.
1932. Dr. Charles A. Behney, 133 S. 36th St., Phila.*
1934. Dr. Moses Behrend, 1738 Pine St., Phila.†
1930. Dr. William Parks Belk, Times Medical Bldg., Ardmore, Pa.*
1923. Dr. David H. Bergey, 206 S. 53d St., Phila.*
1934. Dr. Sydney Geoffrey Biddle, 257 S. 16th St., Phila.†
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1933. Dr. Paul A. Bishop, Penna. Hospital, Phila.*
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1917. Dr. Frank B. Block, 1121 Medical Arts Bldg., Phila.*
1929. Dr. Harry L. Bockus, 250 S. 18th St., Phila.*
1928. Dr. Russell S. Boles, Rittenhouse Plaza, Phila.*

1923. Dr. Earl D. Bond, 707 Old Lancaster Road, Bryn Mawr, Pa.*
1911. Dr. Charles W. Bonney, 1117 Spruce St., Phila.*
1924. Dr. David J. Boon, 1532 N. 15th St., Phila.*
1931. Dr. Edward L. Bortz, 2021 W. Girard Ave., Phila.*
1921. Dr. Francis F. Borzell, 4940 Penn St., Phila.*
1936. Dr. Delazon Swift Bostwick, M.D., Instructor in Otolaryngology, Medical School, U. of P. 106 Linwood Ave., Ardmore, Pa.
1928. Dr. Albert E. Bothe, 133 S. 36th St., Phila.*
1928. Dr. Frederick A. Bothe, 133 S. 36th St., Phila.*
1919. Dr. David R. Bowen, Penna. Hospital, 8th and Spruce Sts., Phila.*
1923. Dr. John O. Bower, 2008 Walnut St., Phila.*
1891. Dr. George M. Boyd, 1909 Spruce St., Phila.*
1907. Dr. Henry P. Boyer, 4602 Baltimore Ave., Phila.*
1925. Dr. Irvine M. Boykin, 922 Medical Arts Bldg., Phila.*
1929. Dr. Samuel Bradbury, 151 West Coulter St., Germantown, Phila.*
1907. Dr. William N. Bradley, 1725 Pine St., Phila.*
1921. Dr. John W. Bransfield, 2101 Spruce St., Phila.*
1903. Dr. Thomas F. Branson, Rosemont, Pa.*
1917. Dr. Ralph S. Bromer, 629 Pembroke Road, Bryn Mawr, Pa.*
1932. Dr. Claude P. Brown, 1930 Chestnut St., Phila.*
1919. Dr. Henry P. Brown, Jr., 1930 Chestnut St., Phila.*
1916. Dr. Samuel H. Brown, 1930 Chestnut St., Phila.*
1887. Dr. Albert P. Brubaker, 3426 Powelton Ave., Phila.*
1935. Dr. Mary Buchanan, M.D., F.A.C.S., Professor of Ophthalmology, Woman's Medical College; Ophthalmologist, College Hospital, Woman's Hospital, State Hospital Norristown, Southern Home for Friendless Children. 1737 Chestnut St., Phila.
1930. Dr. Carl J. Bucher, The Westbury, 15th & Spruce Sts., Phila.*
1916. Dr. Albert C. Buckley, Friends Hospital, Frankford, Phila.*
1935. Dr. J. Nelson Burden, M.D., 4725 Osage Ave., Phila.
1928. Dr. Verne G. Burden, The Warwick, 17th and Locust Sts., Phila.*

1927. Dr. Michael A. Burns, N.E. Corner 20th and Chestnut Sts., Phila.†
1906. Dr. Stillwell C. Burns, 1925 Spring Garden St., Phila.*
1892. Dr. Charles W. Burr, 1527 Pine St., Phila.†
1906. Dr. Ralph Butler, 1930 Chestnut St., Phila.*
1934. Dr. B. Franklin Buzby, 414 Cooper St., Camden, N. J.†
1907. Dr. Williams B. Cadwalader, 133 S. 36th St., Phila.*
1936. Dr. Anthony Roland Camero, B.S., M.D., Pathologist, Misericordia Hospital; Assistant Pathologist, Phila. General Hospital. 4107 Chester Ave., Phila.
1928. Dr. Edward H. Campbell, 2117 Chestnut St., Phila.*
1931. Dr. Abraham Cantarow, 2033 Delancey St., Phila.†
1935. Dr. Laurence S. Carey, M.D., Demonstrator in Medicine, Jefferson Medical College; Physician, Penna. Hospital, Delaware County Hospital. 1 Cedar Lane, Highland Park, Pa.
1931. Dr. Walter L. Cariss, 2043 Walnut St., Phila.*
1930. Dr. Chapin Carpenter, 1930 Chestnut St., Phila.†
1905. Dr. Herbert B. Carpenter, 1805 Spruce St., Phila.*
1926. Dr. Howard Childs Carpenter, 1805 Spruce St., Phila.*
1895. Dr. John T. Carpenter, 1930 Chestnut St., Phila.*
1917. Dr. John B. Carson, 1802 Pine St., Phila.*
1922. Dr. Eugene A. Case, 63 W. LaCrosse Ave., Lansdowne, Pa.*
1933. Dr. W. Edward Chamberlain, Temple University Hospital, Phila.‡
1900. Dr. Burton Chance, 315 S. 15th St., Phila.*
1903. Dr. Walter Chrystie, Bryn Mawr, Pa.*
1929. Dr. Eliot R. Clark, 315 S. 41st St., Phila.*
1934. Dr. Jefferson Hamer Clark, 3701 N. Broad St., Phila.†
1926. Dr. J. Alexander Clarke, 334 S. 21st St., Phila.*
1926. Dr. Louis H. Clerf, 126 S. 10th St., Phila.*
1910. Dr. J. Howard Cloud, 11 W. Montgomery Ave., Ardmore, Pa.*
1903. Dr. George Morrison Coates, 1721 Pine St., Phila.†
1908. Dr. Charles A. E. Codman, S. E. Corner 42d and Spruce Sts., Phila.*
1922. Dr. Leon Solis-Cohen, 1923 Spruce St., Phila.*
1907. Dr. Myer Solis-Cohen, 2110 Spruce St., Phila.*
1888. Dr. S. Solis-Cohen, 1906 Walnut St., Phila.*

1920. Dr. Charles J. Cole, Elkins Park, Pa.*
1898. Dr. Stricker Coles, Bryn Mawr, Pa.*
1934. Dr. Robert C. Colgan, 5734 N. 5th St., Phila.†
1934. Dr. Leon H. Collins, Jr., 401 S. 50th St., Phila.†
1930. Dr. David A. Cooper, 1520 Spruce St., Phila.*
1911. Dr. Walter S. Cornell, 21st and Vine Sts., Phila.*
1914. Dr. Edward F. Corson, M.D., Associate Professor of Dermatology, Jefferson Medical College. 918 Medical Arts Bldg., Phila.
1930. Dr. James E. Cottrell, 2031 Locust St., Phila.*
1924. Dr. Alfred Cowan, 1930 Chestnut St., Phila.*
1904. Dr. Frank A. Craig, Phipps Institute, 7th and Lombard Sts., Phila.*
1907. Dr. George S. Crampton, 2031 Locust St., Phila.*
1924. Dr. Baxter L. Crawford, Jefferson Hospital, 10th and Sansom Sts., Phila.*
1920. Dr. William J. Creighton, N. E. Cor. 20th and Chestnut Sts., Phila.*
1920. Dr. George H. Cross, Chester, Pa.*
1917. Dr. Sumner H. Cross, Jenkintown, Pa.*
1921. Dr. Edward T. Crossan, 5324 Wayne Ave., Phila.*
1904. Dr. John M. Cruice, 406 S. 22d St., Phila.*
1902. Dr. Charles A. Currie, W. Walnut Lane, Germantown, Phila.*
1934. Dr. R. Philip Custer, 4035 Chestnut St., Phila.†
1887. Dr. Judson Daland, 317 S. 18th St., Phila.*
1919. Dr. John R. Davies, Jr., 302 S. 19th St., Phila.*
1896. Dr. Charles N. Davis, 1931 Spruce St., Phila.*
1916. Dr. Warren B. Davis, 135 S. 18th St., Phila.*
1900. Dr. Alexander H. Davisson, Rush Hospital, 33d St. and Lancaster Ave., Phila.*
1935. Dr. J. Montgomery Deaver, M.D., 1830 Delancey Pl., Phila.
1902. Dr. Howard Dehoney, 240 S. 13th St., Phila.*
1935. Dr. Irvin Elmer Deibert, A.B., M.D., F.A.C.S., Member N. J. State Dept. of Health; Member Board of Managers, Camden County Hospital for Treatment Tuberculosis. 618 Benson St., Camden, N. J.
1924. Dr. L. Waller Deichler, 1930 Chestnut St., Phila.*

1923. Dr. Perce De Long, N. E. Cor. 20th and Chestnut Sts., Phila.*
1928. Dr. A. Lovett Dewees, Times Medical Bldg., Ardmore, Pa.*
1908. Dr. Henry K. Dillard, Jr., 234 S. 20th St., Phila.*
1924. Dr. Edward S. Dillon, 1803 Pine St., Phila.*
1932. Dr. Henry Dintenfass, 1305 Spruce St., Phila.*
1920. Dr. John Diven, 326 S. 19th St., Phila.*
1920. Dr. Joseph C. Doane, 19th and Spruce Sts., Phila.*
1933. Dr. Joseph C. Donnelly, 2008 Walnut St., Phila.‡
1907. Dr. George M. Dorrance, 2101 Spruce St., Phila.*
1902. Dr. Robert N. Downs, Jr., 6008 Greene St., Phila.*
1933. Dr. T. McKean Downs, Green Peace, Mt. Pleasant Road, Bryn Mawr, Pa.*
1910. Dr. William Drayton, Jr., 407 S. 22d St., Phila.*
1935. Dr. William Duane, Jr., A.B., M.D., 2100 Walnut St., Phila.
1935. Dr. Garfield G. Duncan, M.D., 1930 Chestnut St., Phila.
1935. Dr. John T. Eads, M.D., 1901 Walnut St., Phila.
1911. Dr. Henry C. Earnshaw, Bryn Mawr, Pa.*
1930. Dr. John Eiman, Cynwyd, Pa.*
1911. Dr. Eldridge L. Eliason, 326 S. 19th St., Phila.*
1928. Dr. Richard T. Ellison, 815 Medical Arts Bldg., Phila.*
1936. Dr. J. Vernon Ellson, A.B., M.D., Assistant in Obstetrics and Gynecology, Maternity Dept., Penna. Hospital, Phila. Lying-in Hospital, Delaware County Hospital, Outpatient Dept. Jefferson Medical College, Medical Tower Bldg., 255 S. 17th St., Phila.
1904. Dr. Walter Gray Elmer, 1801 Pine St., Phila.*
1934. Dr. William C. Ely, 3912 Chestnut St., Phila.†
1932. Dr. Gilson G. Engel, 1914 Pine St., Phila.*
1934. Dr. Louis D. Englerth, 5030 Oxford Ave., Frankford, Phila.†
1893. Dr. Augustus A. Eshner, 1019 Spruce St., Phila.*
1905. Dr. William Evans, 500 W. Gay St., West Chester, Pa.*
1912. Dr. Curtis C. Eves, 1910 Spruce St., Phila.*
1922. Dr. David L. Farley, 1725 Pine St., Phila.*
1903. Dr. Clifford B. Farr, Bryn Mawr, Pa.*
1893. Dr. William W. Farr, 121 Maplewood Ave., Germantown, Phila.*

1930. Dr. John T. Farrell, Jr., B.S., M.D., Assistant Professor Roentgenology, Jefferson Medical College; Assistant Roentgenologist, Jefferson Hospital; Roentgenologist, Daniel Baugh Institute of Anatomy, Jefferson Medical College; Roentgenologist, White Haven Sanatorium. 235 S. 15th St., Phila.

1935. Dr. L. Kraeer Ferguson, A.B., M.D., F.A.C.S., Associate in Surgery, Hospital U. of P.; Assistant Surgeon, Phila. General Hospital. 133 S. 36th St., Phila.

1936. Dr. Ferdinand Fetter, M.B., M.D., Instructor in Medicine, U. of P.; Assistant Physician, Phila. General Hospital, Presbyterian Hospital, Outpatient Dept., Penna. Hospital. 1817 Pine St., Phila.

1935. Dr. Theodore R. Fetter, M.D., Chief Clinical Assistant, Genito-urinary Service, Jefferson Hospital; Demonstrator, Genito-urinary Surgery, Jefferson Medical College; Assistant Surgeon, Division of Urology, Phila. General Hospital. 255 S. 17th St., Phila.

1924. Dr. Alexander G. Fewell, 1924 Pine St., Phila.*

1884. Dr. Henry M. Fisher, Jenkintown, Pa.*

1910. Dr. John Monroe Fisher, 345 S. 19th St., Phila.*

1928. Dr. Thomas Fitz-Hugh, Jr., 2020 Locust St., Phila.*

1928. Dr. John B. Flick, 1608 Spruce St., Phila.*

1888. Dr. Lawrence F. Flick, 736 Pine St., Phila.*

1908. Dr. Collin Foulkrod, 3910 Chestnut St., Phila.*

1933. Dr. Kenneth Fowler, 51 N. 39th St., Phila.‡

1908. Dr. Herbert Fox, Pepper Laboratory, 36th and Spruce Sts., Phila.*

1906. Dr. Frederick Fraley, 71st and City Line, Overbrook, Pa.*

1897. Dr. Charles H. Frazier, 3400 Spruce St., Phila.*

1935. Dr. Cyrus Ward Fridy, A.M., M.D., 58th St. and Thomas Ave., Phila.

1933. Dr. James Scott Fritch, 269 S. 19th St., Phila.‡

1935. Dr. Wilfred Eyles Fry, M.D., Instructor in Ophthalmology and Ophthalmologic Pathology, U. of P. 1912 Spruce St., Phila.

1933. Dr. Clarence J. Gamble, 537 Allen's Lane, Phila.‡

1899. Dr. Robert G. Gamble, Haverford, Pa.*

1935. Dr. George Davis Gammon, A.B., M.D., Instructor in Medicine, Godey and Seeger Fellow in Clinical Medicine, School of Medicine, U. of P. 2124 Spruce St., Phila.

1931. Dr. Vaughn C. Garner, Germantown Professional Building, Phila.*

1935. Dr. Donald C. Geist, B.A., M.D., F.A.C.S., Assistant in Surgery, Misericordia Hospital, Phila.; Associate in Surgery, Fitzgerald-Mercy Hospital, Darby, Pa.; Instructor in Surgery, Graduate School of Medicine, U. of P. 5302 Spruce St., Phila.

1917. Dr. Arthur H. Gerhard, 1615 N. Delaware Ave., Phila.*

1899. Dr. John H. Gibbon, 1608 Spruce St., Phila.*

1934. Dr. John H. Gibbon, Jr., 1608 Spruce St., Phila.†

1933. Dr. U. Grant Gifford, Kennett Square, Pa.*

1920. Dr. A. Bruce Gill, 1930 Chestnut St., Phila.*

1931. Dr. Robert Louis Gilman, 1930 Chestnut St., Phila.†

1927. Dr. William R. Gilmour, 1737 Chestnut St., Phila.*

1931. Dr. Anthony A. S. Giordano, 1819 S. Broad St., Phila.*

1897. Dr. John H. Girvin, 2120 Walnut St., Phila.*

1920. Dr. Thomas S. Githens, The Cambridge, Wissahickon and School Lane, Phila.*

1906. Dr. John C. Gittings, M.D., William H. Bennett Professor of Pediatrics, School of Medicine, U. of P.; Physician-in-Chief, Children's Hospital, Phila. University Hospital, Phila.

1905. Dr. Ellis E. W. Given, 2714 Columbia Ave., Phila.*

1906. Dr. R. Max Goepp, 518 Medical Arts Bldg., Phila.*

1906. Dr. Harold G. von Goldberg, 2213 Walnut St., Phila.*

1933. Dr. Harold Leon Goldburgh, 1932 Spruce St., Phila.‡

1935. Dr. N. Ralph Goldsmith, M.D., Associate Surgeon, Jewish and Mt. Sinai Hospitals. Medical Arts Bldg., Phila.

1905. Dr. Alfred Gordon, 1900 Locust St., Phila.*

1928. Dr. Burgess L. Gordon, 1832 Spruce St., Phila.*

1894. Dr. Edwin E. Graham, 1713 Spruce St., Phila.*

1926. Dr. Francis C. Grant, 3400 Spruce St., Phila.*

1904. Dr. Charles P. Grayson, 262 S. 15th St., Phila.*

1933. Dr. Sigmund S. Greenbaum, 1714 Pine St., Phila.‡

1910. Dr. Milton J. Greenman, Wistar Institute, 36th St. and Woodland Ave., Phila.*

1932. Dr. George C. Griffith, 3833 Walnut St., Phila.*

1883. Dr. J. P. Crozer Griffith, 1810 Spruce St., Phila.*

1934. Dr. John Q. Griffith, Jr., 214 Glencoe Ave., Upper Darby, Pa.†

1912. Dr. J. Milton Griscom, Medical Tower, 255 S. 17th St., Phila.*

1933. Dr. Charles M. Gruber, Jefferson Medical College, Phila.‡

1932. Dr. Jacques P. Guequierre, Room 806, 1930 Chestnut St., Phila.*

1935. Dr. Samuel Bernard Hadden, M.D., Associate in Neurology, School of Medicine, U. of P.; Visiting Psychiatrist, Phila. General Hospital; Chief of Neuro-psychiatric Section, Protestant Episcopal Hospital. 135 S. 36th St., Phila.

1935. Dr. Harlan F. Haines, M.D., Assistant Physician, Pennsylvania Hospital; Attending Physician, Delaware County Hospital; Instructor of Medicine, Jefferson Medical College. 7115 Llanfair Rd., Bywood, Pa.

1894. Dr. S. McC. Hamill, 1822 Spruce St., Phila.*

1897. Dr. Alfred Hand, Jr., 1724 Pine St., Phila.*

1932. Dr. Stanley E. Harris, Lansdowne, Pa.*

1929. Dr. Francis G. Harrison, 1900 Spruce St., Phila.*

1933. Dr. William John Harrison, 135 S. 17th St., Phila.‡

1903. Dr. Charles D. Hart, Chestnut Hill, Phila.*

1926. Dr. Fred L. Hartmann, 1914 Pine St., Phila.*

1932. Dr. J. Calvin Hartman, 100 W. Walnut Lane, Phila.*

1935. Dr. Benjamin F. Haskell, M.D., Chief of Rectal Clinic, Jefferson Hospital. 1426 Spruce St., Phila.

1907. Dr. Charles J. Hatfield, Phipps Institute, 7th and Lombard Sts., Phila.*

1911. Dr. Charles R. Heed, 1205 Spruce St., Phila.*

1901. Dr. John C. Heisler, 3829 Walnut St., Phila.*

1903. Dr. J. Norman Henry, 1906 Spruce St., Phila.*

1927. Dr. Leon Herman, 801 Medical Arts Bldg., Phila.*

1891. Dr. Addinell Hewson, 257 S. 16th St., Phila.*

1924. Dr. William Hewson, 6013 Greene St., Phila.*

1924. Dr. John C. Hirst, 2d, 500 N. 20th St., Phila.*

1933. Dr. Lewis H. Hitzrot, A.B., M.D., Associate in Medicine, U. of P.; Assistant Ward Physician, University Hospital; Assistant Physician, Metabolic Division, Phila. General Hospital. 1704 Pine St., Phila.

1905. Dr. E. B. Hodge, 2019 Spruce St., Phila.*

1931. Dr. H. Albert Holland, 8200 Crittenden St., Chestnut Hill, Phila.*

1933. Dr. Irving W. Hollingshead, 123 S. 18th St., Phila.*
1932. Dr. I. Pemberton P. Hollingsworth, 33 S. High St., West Chester, Pa.*
1906. Dr. Thomas B. Holloway, 1819 Chestnut St., Phila.*
1919. Dr. Arthur H. Hopkins, 1726 Pine St., Phila.*
1925. Dr. R. Dale Hopkinson, Jenkintown, Pa.*
1928. Dr. Karl M. Houser, 2010 Spruce St., Phila.*
1892. Dr. William E. Hughes, 3945 Chestnut St., Phila.*
1923. Dr. John E. Hume, N. E. Corner 20th and Chestnut Sts., Phila.*
1921. Dr. Robert J. Hunter, 2011 Chestnut St., Phila.*
1926. Dr. David N. Husik, 1930 Chestnut St., Phila.*
1934. Dr. Frank H. Hustead, M.D., 5112 N. Broad St., Phila.
1898. Dr. J. P. Hutchinson, Media, Pa.*
1935. Dr. Helen Ingleby, M.R.C.S. (Eng.), L.R.C.P. (Lond.), M.R.C.P. (Lond.), M.B., B.S. (Univ. of Lond.), Professor of Pathology, Woman's Medical College, East Falls, Phila.
1921. Dr. Robert H. Ivy, 1930 Chestnut St., Phila.*
1917. Dr. Chevalier Jackson, 3432 N. Broad St., Phila.*
1932. Dr. Chevalier Lawrence Jackson, 3432 N. Broad St., Phila.*
1934. Dr. Maurice S. Jacobs, 1723 Pine St., Phila.†
1922. Dr. Howard L. Jameson, 2133 S. 16th St., Phila.*
1913. Dr. William H. Jefferys, Rosemont, Pa.*
1928. Dr. Rutherford L. John, 256 S. 21st St., Phila.*
1926. Dr. George Ernest Johnson, 5341 Chester Ave., Phila.*
1918. Dr. Leon Jonas, 255 S. 17th St., Phila.*
1924. Dr. Harold W. Jones, Room 901, 1930 Chestnut St., Phila.*
1913. Dr. John F. X. Jones, 2056 N. 63d St., Phila.*
1900. Dr. Charles F. Judson, 1005 Spruce St., Phila.*
1902. Dr. Henry D. Jump, 2019 Walnut St., Phila.*
1936. Dr. Thomas M. Kain, M.D., Attending Physician, Cooper Hospital, Camden; Consulting Physician, General Hospital, Lakewood. 403 Cooper St., Camden, N. J.
1903. Dr. F. J. Kalteyer, 1530 Locust St., Phila.*
1926. Dr. Isadore Kaufman, 1616 Walnut St., Phila.*
1923. Dr. James Kay, 600 W. Olney Ave., Phila.*
1912. Dr. Floyd E. Keene, 133 S. 36th St., Phila.*
1913. Dr. Francis J. Kelly, 2211 Locust St., Phila.*

1935. Dr. George F. J. Kelly, M.D., Associate Professor of Ophthalmology, Graduate School of Medicine, U. of P.; Chief of Ophthalmology Service, St. Agnes' Hospital. N.E. cor. 20th and Chestnut Sts., Phila.

1932. Dr. Herbert T. Kelly, 1900 Spruce St., Phila.*

1909. Dr. James A. Kelly, 1815 Spruce St., Phila.*

1912. Dr. Thomas C. Kelly, 105 School Lane, Phila.*

1921. Dr. Richard A. Kern, University Hospital, 36th and Spruce Sts., Phila.*

1935. Dr. Baldwin, L. Keyes, M.D., Chief of Psychopathic Service, Phila. General Hospital; Chief of Psychiatric Clinics, Jefferson Hospital; Honorary Consultant, Penna. Institute for Mental Hygiene; Visiting Psychiatrist, St. Agnes' Hospital; Assistant Neurologist, St. Christopher's Hospital for Children. 2025 Walnut St., Phila.

1930. Dr. Robert A. Kimbrough, Jr., 255 S. 17th St., Phila.*

1936. Dr. Orville C. King, A.B., M.D., Assistant Surgeon, Pennsylvania, Presbyterian, Graduate and Children's Hospitals. Medical Arts Bldg., Phila.

1931. Dr. Willard H. Kinney, 315 S. 17th St., Phila.*

1920. Dr. Joseph V. Klauder, 1934 Spruce St., Phila.*

1920. Dr. Thomas Klein, 250 S. 18th St., Phila.*

1934. Dr. Oram R. Kline, 414 Cooper St., Camden, N. J.†

1913. Dr. Edward J. Klopp, 1611 Spruce St., Phila.*

1932. Dr. John W. Klopp, 618 W. Lehigh Ave., Phila.*

1919. Dr. Norman L. Knipe, 1930 Chestnut St., Phila.*

1908. Dr. Frank C. Knowles, 2035 Spruce St., Phila.*

1925. Dr. Harry E. Knox, 719 66th Ave., Oak Lane, Phila.*

1914. Dr. John A. Kolmer, Cynwyd, Pa.*

1936. Dr. Frank Williamson Konzelmann, A.B., M.D., Director of the Pathological Laboratories, Temple University Hospital. 3638 N. 21st St., Phila.

1932. Dr. Karl Kornblum, Wynnewood, Pa.*

1904. Dr. Frederick Krauss, Room 703, 1930 Chestnut St., Phila.*

1914. Dr. Edward B. Krumbhaar, Box 4310, Chestnut Hill, Phila.*

1900. Dr. Wilmer Krusen, Lansdowne, Pa.*

1932. Dr. Eugene M. Landis, University Hospital, 36th and Spruce Sts., Phila.*

1904. Dr. Henry R. M. Landis, Phipps Institute, 7th and Lombard Sts., Phila.*
1907. Dr. H. Maxwell Langdon, 1530 Locust St., Phila.*
1933. Dr. Roy L. Langdon, School and Gypsy Lanes, Phila.*
1934. Dr. Louis B. Laplace, 1900 Rittenhouse Sq., Phila.†
1926. Dr. George M. Laws, 1907 Spruce St., Phila.†
1920. Dr. Frederic H. Leavitt, 1527 Pine St., Phila.*
1904. Dr. Theodore Le Boutillier, 1930 Chestnut St., Phila.*
1934. Dr. Thomas B. Lee, 622 Cooper St., Camden, N. J.†
1908. Dr. Walter E. Lee, 1833 Pine St., Phila.*
1935. Dr. William T. Lemmon, B.S., M.D., 1930 Chestnut St., Phila.
1920. Dr. Simon S. Leopold, 2025 Spruce St., Phila.*
1933. Dr. J. Walter Levering, 1309 Oak Lane, Phila.‡
1915. Dr. Fielding O. Lewis, 259 S. 17th St., Phila.*
1936. Dr. Walter I. Lillie, M.D., M.S., Professor of Ophthalmology, Temple Medical College. 3701 N. Broad St., Phila.
1904. Dr. Eugene Lindauer, 6451 N. Broad St., Phila.*
1927. Dr. Walter H. Lindsey, 810 W. Dauphin St., Phila.*
1907. Dr. Edward Lodholz, Medical Laboratories, University of Pa., Phila.*
1931. Dr. S. A. Loewenberg, 1905 Spruce St., Phila.*
1934. Dr. C. N. Hugh Long, Maloney Clinic, 36th and Spruce Sts., Phila.†
1933. Dr. Esmond Ray Long, Phipps Institute, 7th and Lombard Sts., Phila.‡
1935. Dr. William L. Long, B.S., M.D., Visiting Neurologist, St. Agnes' Hospital. 2025 Walnut St., Phila.
1893. Dr. Daniel Longaker, 1806 Spruce St., Phila.*
1931. Dr. Edwin P. Longaker, 1806 Spruce St., Phila.*
1921. Dr. Balduin H. E. Lucke, Medical School, University of Pa., Phila.*
1924. Dr. John B. Ludy, 1201 Medical Arts Bldg., Phila.*
1923. Dr. Charles W. Lueders, 1930 Chestnut St., Phila.*
1932. Dr. Francis D. W. Lukens, University Hospital, 36th and Spruce Sts., Phila.*
1930. Dr. Robert M. Lukens, 1923 Spruce St., Phila.†
1929. Dr. Clifford B. Lull, 1731 Pine St., Phila.*
1919. Dr. Frank B. Lynch, Jr., Germantown Hospital, E. Wister St., Phila.†

1914. Dr. B. B. Vincent Lyon, 2031 Locust St., Phila.*
1933. Dr. Leo F. McAndrews, 1930 Chestnut St., Phila.‡
1932. Dr. James F. McCahey, 1709 Pine St., Phila.*
1900. Dr. Daniel J. McCarthy, 2025 Walnut St., Phila.*
1936. Dr. Patrick A. McCarthy, M.D., Assistant Demonstrator, Clinical Surgery, Jefferson Medical College; Assistant in Surgery, Jefferson Hospital; Surgeon, Phila. General Hospital and St. Mary's Hospital. Central Medical Bldg., Phila.
1935. Dr. William U. McClenahan, A.B., M.D., Associate in Medicine, Chestnut Hill Hospital. 3 Summit Ave., Chestnut Hill, Phila.
1931. Dr. Edward McCloskey, 7 E. Chestnut Ave., Chestnut Hill, Phila.*
1935. Dr. James W. McConnell, M.D., Associate Professor of Neurology, Graduate School of Medicine, U. of P. 20th and Chestnut Sts., Phila.
1934. Dr. Grayson P. McCouch, Medical School, University of Pa., Phila.†
1895. Dr. Joseph McFarland, 542 W. Hortter St., Germantown, Phila.*
1931. Dr. Joseph McIver, M.D., Neuropsychiatrist, Phila. General Hospital; Neurologist and Psychiatrist, Misericordia Hospital and Fitzgerald-Mercy Hospital, Lansdowne, Pa. Medical Tower, 255 S. 17th St., Phila.
1905. Dr. R. Tait McKenzie, 2014 Pine St., Phila.*
1933. Dr. James S. McLaughlin, 334 S. 21st St., Phila.*
1924. Dr. Thomas M. McMillan, 2044 Locust St., Phila.*
1924. Dr. F. Maurice McPhedran, Phipps Institute, 7th and Lombard Sts., Phila.*
1932. Dr. Catharine Macfarlane, Medical Arts Bldg., Phila.*
1910. Dr. William H. Mackinney, 1930 Chestnut St., Phila.*
1935. Dr. LeRoy M. A. Maeder, M.A., M.D., LL.B., Instructor in Neurology, Graduate School of Medicine, U. of P.; Medical Director, Penn. Mental Hygiene Committee, Public Charities Association. 203 S. 13th St., Phila.
1935. Dr. Ernest G. Maier, M.D., 1323 N. 15th St., Phila.
1914. Dr. F. Hurst Maier, 2019 Walnut St., Phila.*
1913. Dr. Willis F. Manges, 235 S. 15th St., Phila.*
1889. Dr. Edward Martin, 135 S. 18th St., Phila.*

1935. Dr. James B. Mason, A.B., M.D., M.Sc. (Surgery), F.A.C.S., Instructor in Surgery, Graduate School of Medicine, U. of P.; Assistant Surgeon, Presbyterian, Methodist Episcopal, Stetson Hospitals. 3815 Chestnut St., Phila.

1935. Dr. Robert A. Matthews, B.S., M.D., Clinical Director, Phila. Hospital and Phila. Institute for Feeble Minded; Editor, Transactions, Phila. Psychiatric Society. 111 N. 49th St., Phila.

1932. Dr. Richard Hardaway Meade, Jr., 200 W. Mermaid Lane, Phila.†

1934. Dr. Paul M. Mecray, 405 Cooper St., Camden, N. J.†

1914. Dr. J. Bernhard Mencke, 1816 Spruce St., Phila.*

1923. Dr. Walter Mendelson, 639 Church Lane, Germantown, Phila.*

1922. Dr. Edwin B. Miller, 269 S. 19th St., Phila.*

1935. Dr. Ford A. Miller, Ph.B., M.D., Assistant Professor of Gynecology, Graduate School of Medicine, U. of P.; Associate Obstetrician, Presbyterian Hospital. 20 S. 39th St., Phila.

1934. Dr. Hugh McC. Miller, 1614 Locust St., Phila.†

1932. Dr. M. Valentine Miller, 114 W. Phil-Ellena St., Phila.†

1921. Dr. T. Grier Miller, University Hospital, 36th and Spruce Sts., Phila.*

1904. Dr. Charles F. Mitchell, 2003 Pine St., Phila.*

1921. Dr. Henry K. Mohler, 319 S. 16th St., Phila.*

1932. Dr. Roy W. Mohler, 323 S. 20th St., Phila.*

1932. Dr. Thaddeus L. Montgomery, 1930 Chestnut St., Phila.*

1928. Dr. Virgil H. Moon, Jefferson Medical College, Phila.*

1935. Dr. John Royal Moore, A.B., M.D., Professor of Orthopedic Surgery, Temple Univ. Medical School; Chief Surgeon, Shriners' Hospital. Beury Bldg., Broad St. and Erie Ave., Phila.

1923. Dr. William F. Moore, 255 S. 16th St., Phila.*

1924. Dr. Stirling W. Moorhead, 1523 Pine St., Phila.*

1918. Dr. Arthur C. Morgan, 1930 Chestnut St., Phila.*

1936. Dr. David R. Morgan, M.D., Dr.P.H., M.S., Associate in Pathology and Curator of Museum, Jefferson Medical College. 100 Geneva Ave., Glenside, Pa.

1886. Dr. Caspar Morris, Haverford, Pa.*

1893. Dr. Elliston J. Morris, 128 S. 18th St., Phila.*
1929. Dr. Stuart Mudd, Dept. Bacteriology, Univ. of Penna., Phila.*
1935. Dr. Carroll Mullen, A.B., M.D. 7004 Hilltop Road, Bywood, Upper Darby, Pa.
1934. Dr. Edward A. Mullen, 2615 W. Somerset St., Phila.†
1905. Dr. George P. Müller, 1930 Spruce St., Phila.*
1930. Dr. Douglas P. Murphy, 4312 Pine St., Phila.*
1934. Dr. Eugene C. Murphy, 1841 S. Broad St., Phila.†
1905. Dr. Louis H. Mutschler, 1625 Spruce St., Phila.*
1902. Dr. Charles F. Nassau, 1710 Locust St., Phila.*
1887. Dr. Thomas R. Neilson, 1937 Chestnut St., Phila.*
1936. Dr. Guy M. Nelson, A.B., M.D., Instructor in Medicine, Jefferson Medical College; Clinical Assistant, X-ray Dept., Jefferson Hospital. 928 Clinton St., Phila.
1905. Dr. William S. Newcomet, 3501 Baring St., Phila.*
1905. Dr. Arthur Newlin, 1804 Pine St., Phila.*
1935. Dr. Jesse Thompson Nicholson, B.S., M.D., Phila. Orthopedic, Graduate and Phila. General Hospitals. 1726 Spruce St., Phila.
1899. Dr. William Rufus Nicholson, 2023 Spruce St., Phila.†
1905. Dr. Charles C. Norris, 133 S. 36th St., Phila.*
1933. Dr. Josef B. Nylin, University Hospital, Phila.‡
1913. Dr. Alexander Hay O'Neal, St. Davids, Pa.*
1936. Dr. Theodore Ernest Orr, B.S., M.D., Instructor in Orthopedic Surgery, School of Medicine, U. of P.; Assistant in Orthopedic Surgery, University Hospital; Associate Orthopedic Surgeon, Presbyterian Hospital; Orthopedic Surgeon, Chester County Hospital, West Chester, Pa. 1930 Chestnut St., Phila.
1913. Dr. George W. Outerbridge, 1927 Spruce St., Phila.*
1915. Dr. Hubley R. Owen, 319 S. 16th St., Phila.*
1897. Dr. Francis R. Packard, 304 S. 19th St., Phila.*
1933. Dr. Harold Dean Palmer, 111 N. 49th St., Phila.‡
1906. Dr. Henry K. Pancoast, 544 S. Bowman Ave., Merion, Pa.*
1909. Dr. Benjamin D. Parish, 1927 Spruce St., Phila.*
1899. Dr. William E. Parke, 1534 N. 15th St., Phila.*
1925. Dr. Clarence A. Patten, Suite 2703, 255 S. 17th St., Phila.†

1910. Dr. Ross Vernet Patterson, M.D., ScD., LL.D., Dean and Sutherland M. Prevost Professor of Therapeutics, Jefferson Medical College; Hon. Consulting Physician, Phila. General Hospital; President, Association of Amer. Med. Colleges. 2126 Spruce St., Phila.
1931. Dr. John Davis Paul, 3112 N. Broad St., Phila.*
1932. Dr. Franklin L. Payne, 133 S. 36th St., Phila.*
1922. Dr. P. S. Pelouze, 1737 Chestnut St., Phila.*
1909. Dr. Ralph Pemberton, Paoli, Pa.*
1930. Dr. Eugene P. Pendergrass, Ardmore, Pa.*
1932. Dr. Howard Y. Pennell, West Chester, Pa.*
1914. Dr. O. H. Perry Pepper, University Hospital, 36th and Spruce Sts., Phila.†
1902. Dr. William Pepper, School of Medicine, University of Penna., Phila.*
1916. Dr. Milton F. Percival, 2332 S. Broad St., Phila.*
1917. Dr. Luther C. Peter, 1930 Chestnut St., Phila.*
1905. Dr. George E. Pfahler, 1930 Chestnut St., Phila.*
1915. Dr. Damon B. Pfeiffer, 1822 Pine St., Phila.*
1907. Dr. George W. Pfromm, 1431 N. 15th St., Phila.*
1935. Dr. Arthur W. Phillips, A.B., M.D., Associate in Medicine, School of Medicine and Graduate School of Medicine, U. of P.; Assistant Physician, University Hospital. 3904 Walnut St., Phila.
1907. Dr. Horace Phillips, 4511 Chester Ave., Phila.*
1911. Dr. George Morris Piersol, 1913 Spruce St., Phila.*
1933. Dr. Donald Marion Pillsbury, 133 S. 36th St., Phila.‡
1905. Dr. Robert L. Pitfield, 5211 Wayne Ave., Phila.*
1922. Dr. Henry Pleasants, Jr., West Chester, Pa.*
1932. Dr. Roland De Lance Porter, Jenkintown, Pa.*
1931. Dr. Charles Allen Pryor, 1910 Spruce St., Phila.†
1908. Dr. McCluney Radcliffe, 1930 Chestnut St., Phila.*
1931. Dr. Frank M. Ramsey, Chestnut Hill, Phila.*
1913. Dr. Alexander Randall, 1323 Medical Arts Bldg., Phila.*
1926. Dr. I. S. Ravdin, 4623 Larchwood Ave., Phila.*
1928. Dr. Warren S. Reese, 230 S. 21st St., Phila.*
1925. Dr. Rufus S. Reeves, 2227 Spruce St., Phila.*
1931. Dr. Robert P. Regester, 255 S. 17th St., Phila.*
1920. Dr. Martin E. Rehfuss, N. E. Corner 16th and Spruce Sts., Phila.*

1921. Dr. E. Paul Reiff, 5051 Chestnut St., Phila.*
1919. Dr. Stanley P. Reimann, 516 Arbutus St., Germantown, Phila.*
1936. Dr. John Alfred Reisinger, B.S., M.D., 111 N. 49th St., Phila.
1929. Dr. George S. de Rényi, 212 S. 39th St., Phila.*
1923. Dr. Sidney J. Repplier, Roumfort Road, Chestnut Hill, Phila.*
1919. Dr. Russell Richardson, 320 S. 16th St., Phila.*
1919. Dr. Robert F. Ridpath, 1737 Chestnut St., Phila.*
1898. Dr. David Riesman, 1520 Spruce St., Phila.†
1933. Dr. Damaso de Rivas, Lansdowne, Pa.‡
1932. Dr. Frederick R. Robbins, 258 S. 18th St., Phila.*
1899. Dr. Walter Roberts, 1921 Spruce St., Phila.*
1932. Dr. Harold F. Robertson, 327 S. 17th St., Phila.*
1903. Dr. William Egbert Robertson, 327 S. 17th St., Phila.*
1912. Dr. John Stewart Rodman, 524 Manor Rd., Wynnewood, Pa.*
1934. Dr. Harry L. Rogers, Riverton, N. J.†
1928. Dr. Edward Rose, 255 S. 17th St., Phila.*
1936. Dr. Elizabeth Kirk Rose, A.B., M.D., Assistant Instructor in Pediatrics, School of Medicine, U. of P.; Associate in Pediatrics, Woman's Medical College; Out-patient Staff in Pediatrics, Presbyterian Hospital; Physician-in-Charge, Well-Baby Clinic, Webster Settlement House. 426 Owen Road, Ardmore, Pa.
1909. Dr. Randle C. Rosenberger, 1001 Walnut St., Phila.*
1932. Dr. Harry A. Rothrock, West Chester, Pa.*
1936. Dr. Norman Rothschild, M.D., Associate Clinical Professor of Surgery, Graduate School of Medicine, U. of P.; Associate Surgeon, Graduate Hospital; Surgeon, Northern Liberties Hospital and Tumor Clinic, Jewish Hospital. 235 S. 15th St., Phila.
1933. Dr. Leonard George Rowntree, The Barclay, 18th and Rittenhouse Sts., Phila.‡
1933. Dr. Jay Besson Rudolphy, 1924 Pine St., Phila.‡
1905. Dr. J. Torrance Rugh, 911 Medical Arts Bldg., Phila.*
1929. Dr. William J. Ryan, Medical Arts Bldg., Phila.*
1905. Dr. Paul J. Sartain, 2006 Walnut St., Phila.*
1908. Dr. Albert C. Sautter, Germantown Professional Bldg., Phila.*

1927. Dr. Gordon J. Saxon, 1506 Medical Arts Bldg., Phila.*
1906. Dr. Edwin S. Saylor, 1737 Chestnut St., Phila.*
1920. Dr. Hunter W. Scarlett, 230 S. 21st St., Phila.*
1917. Dr. J. Parsons Schaeffer, 4634 Spruce St., Phila.*
1932. Dr. Howard W. Schaffer, 3475 Midvale Ave., Phila.*
1929. Dr. Lewis C. Scheffey, 255 S. 17th St., Phila.*
1929. Dr. Harry P. Schenck, 1912 Spruce St., Phila.*
1917. Dr. Truman G. Schnabel, 1704 Pine St., Phila.*
1917. Dr. Charles H. Schoff, Media, Pa.*
1928. Dr. Frederick S. Schofield, 822 Medical Arts Bldg., Phila.*
1921. Dr. Edward A. Schumann, 1814 Spruce St., Phila.*
1887. Dr. George E. de Schweinitz, 1705 Walnut St., Phila.*
1930. Dr. John P. Scott, 1803 Pine St., Phila.*
1917. Dr. Charles A. Service, Bala, Pa.*
1924. Dr. Thomas A. Shallow, 3942 Chestnut St., Phila.*
1908. Dr. Charles E. G. Shannon, Room 1107, 1930 Chestnut St., Phila.*
1928. Dr. John S. Sharpe, Haverford, Pa.*
1928. Dr. Frederick C. Sharpless, Rosemont, Pa.*
1897. Dr. William T. Sharpless, West Chester, Pa.*
1931. Dr. William C. Sheehan, 8820 Germantown Ave., Phila.*
1932. Dr. Joyce T. Sheridan, 412 W. Durham St., Phila.*
1906. Dr. William G. Shields, 414 School Lane, Phila.*
1936. Dr. James Shelby Shipman, M.S., M.D., Ophthalmologist, Cooper Hospital, Camden. 542 Cooper St., Camden, N. J.
1935. Dr. Robert Shoemaker, 3rd, M.D., Roentgenologist, Lankenau Hospital. Hatboro, Pa.
1896. Dr. William T. Shoemaker, 2017 Locust St., Phila.*
1900. Dr. Edward A. Shumway, 1737 Chestnut St., Phila.*
1936. Dr. Benjamin H. Shuster, M.D., Associate Professor of Neuro-otology, Graduate School of Medicine, U. of P.; Associate in Otolaryngology, School of Medicine, U. of P.; Laryngologist, Dept. of Tuberculosis, Phila. General Hospital; Laryngological Staff, Mt. Sinai Hospital. 1930 Chestnut St., Phila.
1903. Dr. John F. Sinclair, 4103 Walnut St., Phila.*
1907. Dr. Francis W. Sinkler, 1226 Medical Arts Bldg., Phila.*
1928. Dr. Samuel R. Skillern, 1734 Pine St., Phila.*

1933. Dr. Donald Campbell Smelzer, Graduate Hospital, Phila.‡
1929. Dr. Austin T. Smith, 259 S. 17th St., Phila.*
1933. Dr. Lauren Howe Smith, 111 N. 49th St., Phila.‡
1936. Dr. Richard Manges Smith, B.S., M.D., Demonstrator, Jefferson Medical College; Chief Clinical Assistant, X-ray Dept., Jefferson Hospital. 329 S. 12th St., Phila.
1927. Dr. Calvin M. Smyth, Jr., 2021 Spruce St., Phila.*
1919. Dr. Henry Field Smyth, Wayne, Pa.*
1935. Dr. Martin J. Sokoloff, M.D., Demonstrator in Medicine, Jefferson Medical College; Visiting Physician, White Haven Sanatorium, Pa. 255 S. 17th St., Phila.
1933. Dr. Varnum C. Southworth, Germantown Professional Bldg., Phila.‡
1933. Dr. Edgar W. Spackman, 1824 Chestnut St., Phila.*†
1928. Dr. Edmund B. Spaeth, 1930 Chestnut St., Phila.*
1935. Dr. Ernest Spiegel, M.D., Professor of Experimental and Applied Neurology, Temple University School of Medicine, D. J. McCarthy Foundation; Docent, University of Vienna. Temple University Medical School, Broad and Ontario Sts., Phila.
1897. Dr. William G. Spiller, 4409 Pine St., Phila.*
1929. Dr. Marshall B. Sponsler, 1934 Spruce St., Phila.*
1894. Dr. B. Franklin Stahl, Haverford, Pa.*
1909. Dr. J. Clinton Starbuck, 42 East Washington St., Media, Pa.*
1927. Dr. Isaac Starr, Jr., 505 Cresheim Valley Rd., Phila.*
1912. Dr. Nathan P. Stauffer, 1900 Rittenhouse Sq., Phila.*
1936. Dr. Edward Steinfield, M.D., Associate Professor of Medicine, Graduate School of Medicine, U. of P.; Assistant Professor of Medicine, Temple University; Director Clinical Laboratory, Jewish Hospital. N.E. Cor. 18th and Chestnut Sts., Phila.
1895. Dr. Alfred Stengel, Maloney Clinic, University Hospital, 36th and Spruce Sts., Phila.*
1901. Dr. Arthur A. Stevens, 314 S. 16th St., Phila.*
1934. Dr. Harold L. Stewart, Jefferson Medical College, Phila.†
1914. Dr. Thomas S. Stewart, 1532 Pine St., Phila.*
1931. Dr. Merritt H. Stiles, 113 W. Chestnut Ave., Phila.*
1934. Dr. Cheney M. Stimson, M.D., F.A.C.S. Greene and Harvey Sts., Germantown, Phila.

1925. Dr. John H. Stokes, 3800 Chestnut St., Phila.*
1928. Dr. Joseph Stokes, Jr., 159 W. Coulter St., Phila.*
1934. Dr. Philip S. Stout, 269 S. 19th St., Phila.†
1923. Dr. Edward A. Strecker, 111 N. 49th St., Phila.*
1923. Dr. William D. Stroud, 1011 Clinton St., Phila.*
1933. Dr. Harry Stuckert, 248 S. 21st St., Phila.*
1927. Dr. Samuel B. Sturgis, Ardmore, Pa.*
1934. Dr. Thomas J. Summey, 1930 Chestnut St., Phila.†
1930. Dr. F. William Sunderman, 2210 Delancey St., Phila.*
1936. Dr. James Miller Surver, M.D., Assistant Physician, Outpatient Department, Penna. Hospital and Jefferson Hospital. 1832 Spruce St., Phila.
1928. Dr. William B. Swartley, 6002 Greene St., Phila.*
1934. Dr. John A. Sweeney, 1900 Rittenhouse Sq., Phila.†
1900. Dr. James Ely Talley, 1811 Spruce St., Phila.*
1933. Dr. Herbert W. Taylor, Haverford, Pa.‡
1931. Dr. Norman H. Taylor, 100 W. Evergreen Ave., Phila.*
1887. Dr. William J. Taylor, 1825 Pine St., Phila.*
1928. Dr. J. Earl Thomas, Drexel Hill, Pa.*
1907. Dr. T. Turner Thomas, 1737 Chestnut St., Phila.*
1927. Dr. J. Monroe Thorington, 2031 Chestnut St., Phila.*
1898. Dr. Edward Q. Thornton, 1331 Pine St., Phila.*
1936. Dr. Francis Quicksall Thorp, B.S. (Chem. Eng.), M.D., Associate in Cardiology, School of Medicine, U. of P. 4321 Frankford Ave., Phila.
1930. Dr. Edward S. Thorpe, Jr., 133 S. 36th St., Phila.*
1936. Dr. William J. Thudium, A.B., M.D., Demonstrator of Gynecology, Demonstrator of Anatomy, Baugh Institute, Jefferson Medical College; Attending Gynecologist, St. Joseph's Hospital; Attending Gynecologist and Obstetrician, Phila. General Hospital. Medical Arts Bldg., Phila.
1935. Dr. L. M. Tocantins, M.D., 350 E. Meehan Ave., Phila.
1935. Dr. Owen J. Toland, B.S., M.D., Instructor in Obstetrics, School of Medicine, U. of P.; Assistant Obstetrician, University and Penna. Hospitals; Assistant Obstetrician and Gynecologist, Phila. General Hospital; Obstetrician, Episcopal and Chester County Hospitals. 323 S. 20th St., Phila.
1912. Dr. Robert G. Torrey, 1716 Locust St., Phila.*

1934. Dr. Martha Tracy, 516 W. Coulter St., Phila.†
1908. Dr. Stephen E. Tracy, 1930 Chestnut St., Phila.*
1926. Dr. Gabriel Tucker, M.D., Professor of Bronchoscopy and Laryngeal Surgery, Graduate School of Medicine, U. of P.; Professor of Clinical Bronchoscopy and Esophagoscopy, School of Medicine, U. of P.; Bronchoscopist, University, Graduate, Misericordia, Fitzgerald-Mercy, Bryn Mawr and Abington Hospitals. 326 S. 19th St., Phila.
1933. Dr. Henry J. Tumen, 2022 Spruce St., Phila.‡
1894. Dr. Joseph Price Tunis, University Club, Phila.*
1935. Dr. William G. Turnbull, A.B., M.D., Superintendent, Phila. General Hospital, Phila.
1923. Dr. Creighton H. Turner, 1731 Pine St., Phila.*
1929. Dr. Ralph M. Tyson, 334 S. 21st St., Phila.*
1907. Dr. Josephus T. Ullom, Carpenter and Quincy Sts., Phila.*
1934. Dr. George A. Ulrich, 309 S. 12th St., Phila.†
1873. Dr. Arthur Van Harlingen, Bryn Mawr, Pa.*
1903. Dr. William Turner Van Pelt, 59 Bethlehem Pike, Chestnut Hill, Phila.*
1933. Dr. Jacob Hursh Vastine, 2d, 1930 Chestnut St., Phila.‡
1912. Dr. Norris Wistar Vaux, 2031 Locust St., Phila.*
1903. Dr. William S. Wadsworth, 3914 Baltimore Ave., Phila.*
1927. Dr. Arthur J. Wagers, 1429 Spruce St., Phila.*
1928. Dr. George W. Wagoner, Haverford Gables, Haverford, Pa.*
1931. Dr. Herschel C. Walker, Wynnewood, Pa.*
1906. Dr. John K. Walker, M.D., Media, Pa.
1907. Dr. Warren Walker, 1819 Chestnut St., Phila.*
1932. Dr. Adolph A. Walkling, Medical Arts Bldg., Phila.*
1904. Dr. Joseph Walsh, 521 Medical Arts Bldg., Phila.*
1895. Dr. Arthur W. Watson, 2013 Locust St., Phila.*
1923. Dr. William R. Watson, 2300 Pine St., Phila.*
1932. Dr. Charles C. Watt, Jr., 6605 Wayne Ave., Phila.*
1933. Dr. James Jamison Waygood, 3464 W. School Lane, Phila.‡
1903. Dr. Charles H. Weber, 2048 Pine St., Phila.*
1930. Dr. S. Dana Weeder, 6110 Greene St., Phila.*
1920. Dr. Fred D. Weidman, 20 Tenby Road, Llanerch, Pa.*
1933. Dr. Benjamin Paul Weiss, The Lenox, 13th and Spruce Sts., Phila.‡

1923. Dr. Edward Weiss, 1923 Spruce St., Phila.*
1913. Dr. P. Frailey Wells, 754 N. 40th St., Phila.*
1935. Dr. George L. Whelan, M.D., M.Med.Sc., Associate in Laryngology, Graduate School of Medicine, U. of P.; Chief of Dept. Otolaryngology, Rush Hospital and Eagleville Sanitarium, Pa.; Otolaryngologist, City Chest Clinics. 2100 Walnut St., Phila.
1921. Dr. William Whitaker, 5448 Germantown Ave., Phila.*
1901. Dr. Courtland Y. White, 6611 N. 10th St., Phila.*
1925. Dr. Bernard P. Widmann, 250 S. 18th St., Phila.*
1914. Dr. De Forest P. Willard, 1726 Spruce St., Phila.*
1935. Dr. John H. Willard, M.D., 250 S. 18th St., Phila.
1907. Dr. Carl Williams, School Lane and Greene St., Phila.*
1924. Dr. Horace J. Williams, 5908 Greene St., Phila.*
1920. Dr. Philip F. Williams, 2206 Locust St., Phila.*
1927. Dr. Ernest G. Williamson, 6353 Woodbine Ave., Phila.*
1916. Dr. Harry B. Wilmer, 6013 Greene St., Phila.*
1921. Dr. George Wilson, 133 S. 36th St., Phila.*
1902. Dr. Samuel M. Wilson, 1930 Chestnut St., Phila.*
1897. Dr. W. Reynolds Wilson, Villa Nova, Pa.*
1904. Dr. James W. Wister, 5430 Germantown Ave., Phila.*
1933. Dr. Michael G. Wohl, 1727 Pine St., Phila.‡
1918. Dr. Charles C. Wolferth, S. E. Corner 36th and Spruce Sts., Phila.*
1893. Dr. Alfred C. Wood, 2035 Walnut St., Phila.*
1932. Dr. Francis C. Wood, Wynnewood, Pa.*
1900. Dr. George B. Wood, N. E. Corner 20th and Chestnut Sts., Phila.*
1903. Dr. Horatio C. Wood, 319 S. 41st St., Phila.*
1897. Dr. George Woodward, W. Willow Grove Ave., Chestnut Hill, Phila.*
1928. Dr. Carroll S. Wright, 1402 Spruce St., Phila.*
1894. Dr. William Zentmayer, Room 803, 1930 Chestnut St., Phila.*
1895. Dr. Mason W. Zimmerman, 1518 Waverly St., Phila.*
1933. Dr. Jay D. Zulick, 2008 Walnut St., Phila.‡

NON-RESIDENT FELLOWS

* For degrees and titles see TRANSACTIONS, 1932, LIV, xi
† For degrees and titles see TRANSACTIONS, 1934, II, No. 3, liii

ELECTED

1883. DR. CHARLES BAUM, 123 W. Main St., Middletown, Pa.*

1916. CAPTAIN WILLIAM H. BELL, M.C., U.S.N., Wardman Park Hotel, Washington, D. C.*

1903. DR. M. H. BIGGS, Rutherfordton, N. C.*

1908. DR. WILLIAM W. CADBURY, Lingnan University, Canton, China.*

1936. DR. FRANCIS MANN CLARKE, B.S., M.D., Attending Surgeon, St. Peter's Hospital, New Brunswick. 116 New St., New Brunswick, N. J.

1910. DR. W. TAYLOR CUMMINS, 975 Bush St., San Francisco, Cal.*

1936. DR. JOHN MCCREA DICKSON, M.S., M.D., Sc.D., F.A.C.S., Associate Surgeon, Chambersburg Hospital, Pa. 103 W. Middle St., Gettysburg, Pa.

1897. DR. W. A. N. DORLAND, 185 N. Wabash Ave., Chicago, Ill.*

1905. DR. JOSEPH S. EVANS, JR., 1300 University Ave., Madison, Wis.*

1935. DR. JOHN EDGAR FRETZ, A.M., M.D., F.A.C.P., Physician, Easton Children's Home; Consulting Physician, Warren Hospital, Phillipsburg, N. J. Easton, Pa.

1913. DR. NATHANIEL GATES, 10 Peterboro Ave., Detroit, Mich.*

1908. DR. EDWARD H. GOODMAN, Dorset, Vt.*

1936. DR. DONALD GUTHRIE, Ph.B., M.D., Chief of Staff, Robert Packer Hospital, Sayre, Pa.

1902. DR. NORMAN B. GWYN, 109 Madison Ave., Toronto, Canada.*

1928. DR. JOSEPH M. HAYMAN, Lakeside Hospital, Cleveland, O.*

1935. DR. EMORY HILL, A.B., M.D., Professor of Ophthalmology, Medical College of Va.; Ophthalmic Surgeon, Hospitals of Medical College of Va. Professional Bldg., Richmond, Va.

1892. DR. GUY HINSDALE, White Sulphur Springs, W. Va.*

1908. DR. A. PARKER HITCHENS, Major M.C., U.S.A., in charge 6th Corps Area Laboratory, Ft. Sheridan, Ill.*

1908. Dr. Daniel M. Hoyt, Veterans' Bureau Hospital, St. Petersburg, Fla.*

1912. Dr. John W. Hunter, McDaniel, Md.*

1900. Dr. John H. Jopson, 1824 Pine St., Phila.*

1910. Dr. Howard T. Karsner, Institute of Pathology, Western Reserve University, Cleveland, Ohio.*

1887. Dr. Howard A. Kelly, 1418 Eutaw Place, Baltimore, Md.*

1934. Dr. Roland N. Klemmer, 439 N. Duke St., Lancaster, Pa.†

1935. Dr. Hunter H. McGuire, M.D., President and Ophthalmologist, Winchester Memorial Hospital; Oculist, Baltimore and Ohio R. R. Co. and Southern Rwy. System. 105 N. Braddock St., Winchester, Va.

1916. Dr. Howard A. McKnight, Tecumseh Bldg., Springfield, Ohio.*

1900. Dr. Robert Phillips McReynolds, 213 S. Broadway, Los Angeles, Cal.*

1911. Dr. Edward B. Meigs, 1736 M St., N. W., Washington, D. C.*

1936. Dr. William Shainline Middleton, M.D., Professor of Medicine, U. of Wis.; Physician, Wisconsin State General Hospital. Univ. of Wisconsin, Madison, Wis.

1894. Dr. D. J. Milton Miller, 104 S. Jackson Ave., Ventnor, N. J.*

1917. Dr. A. Graeme Mitchell, University of Cincinnati, Cincinnati, Ohio.*

1915. Dr. John H. Musser, B.S., M.D., Professor of Medicine and Head of Dept., School of Medicine, Tulane Univ. of La.; Memb. Council on Medical Education and Hospitals, Amer. Med. Assoc. 1430 Tulane Ave., New Orleans, La.

1905. Dr. George W. Norris, Dimock, Pa.*

1901. Dr. Henry Norris, Waverly Mills, S. C.*

1892. Dr. Richard C. Norris, Arlington, Vt.*

1926. Dr. John Rodman Paul, Dept. Internal Medicine, Yale University, New Haven, Conn.*

1907. Dr. George E. Price, Stimson Bldg., Seattle, Wash.*

1936. Dr. James J. Quiney, M.D., F.A.C.R., Roentgenologist, Easton Hospital, Easton, Pa. and Warren Hospital, Phillipsburg, N. J. 309 Bushkill St., Easton, Pa.

1904. Dr. M. P. Ravenel, 203 Westmount Ave., Columbia, Mo.*

1907. Dr. B. Franklin Royer, 11 Wyoming Ave., Tunkhannock, Pa.*

1913. Dr. George L. de Schweinitz, 85 East Broad St., Bethlehem, Pa.*

1908. Dr. Harlan Shoemaker, 1930 Wilshire Blvd., Los Angeles, Cal.*

1932. Dr. Alvin E. Siegel, 609 Georgia Casualty Bldg., Macon, Ga.*

1935. Dr. George N. J. Sommer, M.D., 120 W. State St., Trenton, N. J.

1934. Dr. Sloan G. Stewart, M.D., Pacific and N. Carolina Aves., Atlantic City, N. J.

1900. Dr. John M. Swan, 457 Park Ave., Rochester, N. Y.*

1913. Dr. William Penn Vail, Blairstown, N. J.*

1897. Dr. Clarence A. Veasey, Suite 1569, Paulson Bldg., Spokane, Wash.*

1935. Dr. James Macfarlane Winfield, M.D., Wilmington, Del.

1911. Dr. Andrew H. Woods, 1100 N. Dubuque St., Iowa City, Iowa.*

HONORARY FELLOWS

(Limited to Fifty, of whom Twenty may be Foreigners)

American

ELECTED

1909. Crile, George W., M.D., Cleveland Clinic, Euclid Ave. at E. Ninety-third St., Cleveland, O.

1916. Estes, William Lawrence, M.D., 805 Delaware Ave., Bethlehem, Pa.

1912. McCaw, Brig.-Gen. Walter D., M.D., Assistant Surgeon-General, U. S. A., retired, Woodstock, Ulster Co., N. Y.

1906. Mayo, William J., M.D., Rochester, Minn.

1917. Miner, Charles H., M.D., 264 S. Franklin St., Wilkes-Barre, Pa.

1906. Pilcher, Lewis Stephen, M.D., 386 Park St., Upper Montclair, N. J.

1936. Richards, Alfred Newton, Ph.D., Sc.D., M.D. (Hon.), School of Medicine, University of Penna., Phila., Pa.

Foreign

1928. Archibald, Edward, M.D., McGill University, Montreal, Canada.

1924. Hopkins, Sir F. Gowland, M.D., Biochemical Department, University of Cambridge, Cambridge, England.

1922. McCarrison, Sir Robert, Kt. C.I.E., M.D., D.Sc., LL.D., F.R.C.P., Major-General Indian Medical Service (retired). 18 Linton Road, Oxford, England.

1924. Macleod, John James R., M.D., M.B., D.Sc. (Hon.), LL.D., F.R.S., Marischal College, Aberdeen, Scotland.

1906. Myles, Sir Thomas, M.D., 33 Merion Square, W. Dublin, Ireland.

1885. Rendu, Jean, M.D., Lyons, France.

1928. Rolleston, Sir Humphrey, Bart., G.C.V.O., K.C.B., M.D., D.C.L. (Durh.), LL.D., D.Sc., Martins, Haslemere, Surrey, England.

NECROLOGICAL LIST

Fellows

DR. ARCHIBALD BYRON MACALLUM (Honorary)	April	5,	1934
DR. C. CARL HUBER	December	26,	1934
DR. EDMUND B. PIPER	January	14,	1935
DR. THEODORE C. STELLWAGEN	March	15,	1935
DR. FIELDING GARRISON (Honorary)	April	18,	1935
DR. DELNO E. KERCHER	May	6,	1935
DR. WILLIAM J. MERRILL	May	10,	1935
DR. CHARLES A. FIFE	June	15,	1935
DR. THOMAS McCRAE	June	30,	1935
DR. BARTON COOKE HIRST	September	2,	1935
DR. ALEXANDER C. ABBOTT	September	11,	1935
DR. JOHN R. FORST	November	1,	1935
DR. CHARLES T. NOBLE	November	21,	1935
DR. CHARLES LOOMIS DANA (Honorary)	December	12,	1935
DR. ALBERT A. GHRISKEY	December	28,	1935
DR. WARD BRINTON	December	29,	1935

INDEX

(Pp. 1–74, i–xiv, in No. 1; pp. 75–106, xv–lxxxii, in No. 2)

Abbott, Alexander Crevir, Memoir of, xxx
Adler, F. H., 33, 83
Alvarenga Prize, lv
Anders, J. M., i
Anders, James M., Fund Lecture, 6, 77, lv
Andrews, James C., 98
Anthes, E. H., 70
Appleman, L. F., 34
Arnett, John H., 67, 70

Babbitt, James A., 43
Batson, Oscar V., 36
Beardsley, E. J. G., 16
Beekman, Fenwick, 68
Behrend, Moses, 62
Belk, William P., 54
Bellet, Samuel, 52
Berner, George E., 33
Bernhard, Wm. G., 96
Blumberg, Nathan, 51
Boerner, Frederick, 94
Boles, Russel S., 62
Bortz, Edward L., 63
Bronk, D. W., 14
Brown, Herman, 102
Brown, L. Emmitt, Jr., 101
Brundage, John T., 50
Burchell, Edgar B., 83
Butler, Ralph, 93

Campbell, Edward H., 46, 86
Cantarow, A., 58
Chance, Burton, 69
Coates, George M., 40, 43, 44, 46, 48, 86, 89, 93, 94
Codellas, Pan S., 104
Committees, Standing, 1935, lii
Comroe, Bernard I., 57
Cowan, Alfred, 83

Dandy, Walter E., 89
Davis, Warren B., 92
Delaney, Brig. Gen. M. A., 105
DeLong, Perce, 33, 84
Dillon, Edward S., 60
Dintenfass, Henry, 44
Doane, Joseph C., 51
Dyer, W. Wallace, 60

Edeiken, Joseph, 97
Ersner, Mathew S., 46, 49
Eves, Curtis C., 38

Farrell, John T., Jr., 56
Feldman, Jacob B., 83
Fellows, Honorary, lxxxi
Fellows, Non-resident, lxxviii
Fellows, Roster of, lvi
Fels, Samuel S., 101
Fewell, A. G., 33, 84
Fife, Charles Andrew, Memoir of, xix
Fitz-Hugh, Thomas, Jr., 100
Fry, W. E., 33, 34

General Medicine, Section on, 50, 95, liv
Gershon-Cohen, J., 101
Gibbon, John H., xv
Giordano, A. A. S., 37
Gleason, Edward, Memoir of, 45
Goldstein, Hyman, 68
Goodfriend, David J., 90
Gordon, Burgess, 55, 104
Gouley, Benjamin A., 52
Grant, Francis C., 1, 90
Griffith, Ivor, 104
Griffith, Reynold S., 66
Groff, Robert A., 86
Gruber, Charles M., 50

Hansell, Howard F., Memoir of, 33, viii
Hatfield, Nathan Lewis, Lecture, 2, lv
Heidelberger, Michael, 2
Hemsath, Frederick A., 35
Hewson, Wm., 85
Hirst, Barton C., xi
Hirst, Barton Cooke, Memoir of, xxv
Hitzrot, Lewis H., 95
Holloway, T. B., 83
Hooker, E. Frank, 38
Houser, Karl M., 43, 90
Hunter, Robert J., 41, 93, 104
Husik, Isaac, 69

Israel, S. Leon, 96
Ivy, Robert, 104

Jackson, Chevalier, 36
Jackson, Chevalier L., 46
Jacobs, M. S., 69

Kabakjian, D. K., 68
Kappers, C. V. Ariens, 20
Keeler, J. Clarence, Memoir of, 92
Kelly, Herbert T., 59
Kessler, Henry H., 73
Klauder, Joseph V., 84, 102
Klemmer, Anna P., 65
Klemmer, Roland N., 65
Kline, Oram R., 44, 45, 93
Klopp, John W., 68, 104
Kramer, David W., 53
Kremer, D. N., 61
Krumbhaar, E. B., 69, li
Krusen, Wilmer, 104

Landis, Eugene M., 95
Lectures, List of, lv
Leivy, Frank E., 96
Library, Report of, xxxviii
Lindner, Karl, 34
Long, C. N. H., 75
Lucchesi, Pascal, 42
Luongo, R. A., 68

McAlister, Alexander, 68
McCrae, Thomas, Memoir of, xv
McDaniel, W. B., 2d, 69, 71, 104, li
McFarland, 43
McKenzie, R. Tait, 8
McMillan, Thomas, 52
McPhedran, F. Maurice, 64
Mathews, Robert W., 61
Medical History, Section on, 68, 104, liv
Mengel, W. G., 83
Meyer, George P., 33
Miller, M. Valentine, 92
Mitchell, Weir, Oration, lv
Mosher, Harris P., 80
Mütter Lecture, 80, lv

Naide, Meyer, 95
Necrological List, lxxxii
Newbold, Mary Scott, Lecture, 20, 75, lv
Nicholson, Wm. R., xxv

Officers, 1935, lii
Ophthalmology, Section on, 33, 83, liv
Otolaryngology, Section on, 35, 85, liv

Park, Wm. H., 2
Parke, Wm. E., 60
Pendergrass, Eugene P., 99
Pepper, O. H. Perry, 99
Pepper, Wm., xxx
Percival, M. Fraser, 68
Piper, Edmund B., Memoir of, xi
President's Address, xxxv
Presidents, List of, lv
Prizes, lv
Public Health and Industrial Hygiene, Section on, 72, 105, liv

Randall, Alexander, 98
Rankin, Charles A., 83
Reese, W. S., 33, 83
Rice, John L., 77
Riesman, David, 54
Roberts, Walter, 44
Roessler, Hugo, 68
Rogers, Wm., 36
Rosenau, Milton J., 6

Sacks, 40
Samuela, Bernard, 83
Scarf, Maxwell, 96
Scarlett, Hunter W., 34
Schenck, Harry P., 46
Schnabel, Truman G., 96
de Schweinitz, George E., 84
Sections, Organization of, 1935, liv
Shannon, C. E. G., 33, viii
Shay, Harry, 101
Shuster, Benjamin H., 39, 91
Skillern, Samuel R., Jr., 46, 88
Smith, R. Manges, 66
Smyth, Henry Field, 72
Spaeth, Edmund B., 33, 34, 83, 86
Stengel, Alfred, xxxv
Sterner, James Hervi, 63
Stewart, H. L., 58
Stout, Philip S., 45, 46, 87
Strumia, Max M., 35, 61
Sunderman, F. Wm., 98

Talley, James E., xix
Taylor, Wm. J., 69
Tucker, Gabriel, 43

Vander Veer, Joseph B., 101

Waugh, J. R., 49
Weeks, Webb W., 34
Wieder, Henry S., 44, 49
Williams, Horace J., 41
Wilson, James Cornelius, Memoir of, i
Wolferth, Charles C., 97
Wood, Earl Le Roy, 38
Wood, George B., 87
Wright, Sydney L., 70

Zentmayer, William, 33, 84
Zirkle, Conway, 104

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